



# PRODUCTS CATALOG

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## 1. Elemental Nanoparticles

Formula Stock # CAS #	Abbreviations used in this catalog  <b>APS:</b> Average Particle Size, <b>ACS:</b> Average Crystallite Size , <b>OD:</b> Outside Diameter, <b>ID:</b> Inside Diameter <b>SSA:</b> Specific Surface Area.	Price (US\$/quantity)
<b>Ag</b> 0474DFF2 7440-22-4	Silver Powder, 99.95% (metal basis) Thickness: 80 - 500 nm Length & width: 8-10 $\mu\text{m}$ SSA: 0.6-1.2 $\text{m}^2/\text{g}$ Particle Morphology: flaky Crystallographic Structure: cubic	\$168/25g \$368/100g \$1,028/500g \$1,760/1kg
<b>Ag</b> 0474DFF1 7440-22-4	Silver Powder, 99.95% (metal basis) Thickness: 80 - 500 nm Length & width: 5-8 $\mu\text{m}$ SSA: 0.7-1.3 $\text{m}^2/\text{g}$ Particle Morphology: flaky Crystallographic Structure: cubic	\$184/25g \$398/100g \$1,081/500g \$1,867/1kg
<b>Ag</b> 0474DFF3 7440-22-4	Silver Powder, 99.95% (metal basis) Thickness: 80 - 500 nm Length & width: 2-4 $\mu\text{m}$ SSA: 0.8-1.5 $\text{m}^2/\text{g}$ Particle Morphology: flaky Crystallographic Structure: cubic	\$198/25g \$414/100g \$1,137/500g \$1,962/1kg
<b>Ag</b> 0478YD1 7440-22-4	Silver Powder, 99.5% (metal basis) APS: (20-80) X (600-1200) X (600-1200) nm SSA: 3 $\text{m}^2/\text{g}$ Particle Morphology: flaky Crystallographic Structure: cubic	\$240/25g \$653/100g \$1,693/500g \$2,680/1kg
<b>Ag</b> 0472DFS3 7440-22-4	Silver Powder, 99.95% (metal basis) APS: 1.5-2.5 $\mu\text{m}$ SSA: 0.4-0.8 $\text{m}^2/\text{g}$ Particle Morphology: spherical Crystallographic Structure: cubic	\$168/25g \$368/100g \$1,028/500g \$1,763/1kg
<b>Ag</b> 0471CD 7440-22-4	Silver Powder, 99% (metal basis) APS: 90-210 nm SSA: 2.40-4.42 $\text{m}^2/\text{g}$ Particle Morphology: spherical Crystallographic Structure: cubic	\$193/25g \$473/100g \$1,323/500g \$2,327/1kg
<b>Ag</b> 0476JY 7440-22-4	Silver Powder, 99.5% (metal basis) APS: 35 nm SSA: 30-50 $\text{m}^2/\text{g}$ Particle Morphology: spherical Crystallographic Structure: cubic	\$163/5g \$342/25g \$863/100g \$2,397/500g \$4,182/1kg
<b>Ag</b> 0476HW 7440-22-4	Silver (Ag), w/~0.3% PVP(Polyvinylpyrrolidone) Purity: 99.9% APS: 80 nm	\$80/5g \$171/25g
<b>Ag</b> 0477YD 7440-22-4	Silver Powder, 99.9% (metal basis) Surface coated with 0.2 wt% PVP APS: 30-50 nm SSA: 5-10 $\text{m}^2/\text{g}$ Particle Morphology: spherical Crystallographic Structure: cubic	\$105/5g \$220/25g \$557/100g \$1,554/500g \$2,698/1kg

<b>Ag</b> 0477YDC 7440-22-4	Silver Powder, 99.9% (metal basis) Surface coated with 0.2 wt% oleic acid. APS: 30-50 nm SSA: 5-10 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$220/25g \$557/100g \$1,554/500g \$2,698/1kg
<b>Ag</b> 0478YD1 7440-22-4	Silver Powder, 99.5% (metal basis) Thickness: 20-80 nm, width & length: 0.6-1.2 um SSA: ~ 3 m <sup>2</sup> /g Particle Morphology: flaky Crystallographic Structure: cubic	\$276/25g \$750/100g \$1,933/500g \$3,070/1kg
<b>Ag</b> 0475NW2 7440-22-4 UN1170	Silver nanowires (stored in ethanol) Wire average diameter: 227 ± 80 nm Wire length: 6.1 ± 2.1 um Purity: 99.9+%	\$290/g
<b>Ag</b> 0475NW1 7440-22-4 UN1170	Silver nanowires (stored in ethanol) Wire average diameter: 274 ± 39 nm Wire length: 5.3 ± 3.3 um Purity: 99.9+%	\$290/g
<b>Ag</b> 0475NW4 7440-22-4 UN1170	Silver nanowires (stored in ethanol) Wire average diameter: 386 ± 48 nm Wire length: 8.5 ± 3.6 um Purity: 99.9+%	\$290/g
<b>Al</b> 0136JY 7429-90-5 UN1396 Flammable	Aluminum Powder, 99+% (metal basis, O<5%) APS: 18 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$105/5g \$231/25g \$495/100g \$1,518/500g \$2,860/1kg
<b>Au</b> 0795CD 7440-57-5	Gold Powder, 99.99+% APS: 50-100 nm SSA: 3.3 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$408/1g \$1,700/5g
<b>Au</b> 0796XW 7440-57-5	Gold Powder, 99.5+% APS: < 100 nm SSA: 1.3-2.2 m <sup>2</sup> /g Particle Morphology: ~ spherical Crystallographic Structure: cubic	\$1530/6g
<b>C</b> 1310JGY 7440-44-0	<b>Diamond Powder (black), 52-65%</b> APS: 4-25 nm SSA: 360-420 m <sup>2</sup> /g Particle Morphology: spherical & flake Crystallographic Structure: cubic	\$70/5g \$120/25g \$390/100g \$1,500/500g \$2,500/1kg
<b>C</b> 1320JGY 7440-44-0	<b>Diamond Powder (gray), 95%</b> APS: 3.2 nm SSA: 278-335 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$80/5g \$220/25g \$760/100g \$3,080/500g \$4,950/1kg
<b>C</b> 1321JGY 7440-44-0	<b>Diamond Powder (gray), 98+%</b> APS: 6 nm SSA: ~282 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$88/5g \$245/25g \$850/100g \$3,380/500g \$5,550/1kg
<b>C</b> 1211NH 7440-44-0	<b>Nano Activated Carbon</b> APS: 100nm	\$138/100g \$361/500g \$523/1kg

<b>C</b> 1350SL 7440-44-0	<b>Diamond Powder (gray), 97+%</b> APS: 3.5-6.5 nm SSA: 200-450 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$99/5g \$379/25g \$1,290/100g \$5,200/500g \$8,320/1kg
<b>C</b> 1250HT 7440-44-0	<b>Graphite Powders, 99.9%</b> APS: 400 nm Particle Morphology: flaky Crystallographic Structure: hexagonal	\$70/5g \$150/25g \$210/100g \$450/500g \$600/1kg
<b>Co</b> 0276JY 7440-48-4 UN3089 Flammable	Cobalt Powder, 99.8% (metal basis, O<10%) APS: 28 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: hexagonal	\$67/5g \$119/25g \$360/100g \$1,261/500g \$2,398/1kg
<b>Co</b> 0277JY 7440-48-4 UN3089 Flammable	Cobalt Powder (carbon coated), 99.8% (metal basis, O<10%) APS: 28 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: hexagonal	\$70/5g \$127/25g \$381/100g \$1,337/500g \$2,542/1kg
<b>Cr</b> 0240XX 7440-47-3 UN3089 Flammable	Chromium Powder, 99.5% APS: 50 nm Particle Morphology: ~ spherical Crystallographic Structure: cubic	\$225/25g \$724/100g \$2,417/500g \$3,223/1kg
<b>Cu</b> 0296JY 7440-50-8 UN3089 Flammable	Copper Powder, 99.8% (metal basis, O<10%) APS: 25 nm SSA: 30-50 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$69/5g \$121/25g \$374/100g \$1,306/500g \$2,479/1kg
<b>Cu</b> 0297JY 7440-50-8 UN3089 Flammable	Copper Powder (carbon coated), 99.8% (metal basis, O<10%) APS: 25 nm SSA: 30-50 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$75/5g \$136/25g \$407/100g \$1,435/500g \$2,728/1kg
<b>Cu</b> 0298XW 7440-50-8 UN3089 Flammable	Copper Powder, 99% APS: 500 nm Particle Morphology: spherical	\$214/100g \$715/500g \$953/1kg
<b>Fe</b> 0266JY 7439-89-6 UN3089 Flammable	Iron Powder, 99.5% (metal basis, O<10%) APS: 25 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$62/5g \$113/25g \$372/100g \$1,306/500g \$2,480/1kg
<b>Fe</b> 0267JY 7439-89-6 UN3089 Flammable	Iron Powder (carbon coated), 99.5% (metal basis, O<10%) APS: 25 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$75/5g \$137/25g \$407/100g \$1,435/500g \$2,728/1kg
<b>Fe</b> 8001NJ 7439-89-6	Zero-Valent Iron Powder (passivated with iron hydroxides and iron oxides) Purity: 98+% (metal basis, O < 15%, H < 1%) APS: 100-250 nm SSA: 3-7 m <sup>2</sup> /g Particle Morphology: ~ spherical	\$198/5g \$418/25g \$858/100g \$1,518/500g

	Crystallographic Structure: cubic	\$2,178/1kg
<b>Mo</b> 0423HW 7439-98-7 UN3089 Flammable	Molybdenum (Mo) Purity: 99.5% (metal basis) APS: 70 nm SSA: Color: Morphology: spherical True density: 10.22 g/cm <sup>3</sup>	\$121/25g \$328/100g \$1452/500g \$2,508/1kg
<b>Ni</b> 0283HW 7440-02-0 UN3089 Flammable	Nickel Powder, 99.7+% APS: 30-50 nm SSA: 12 m <sup>2</sup> /g Particle Morphology: Crystallographic Structure: cubic	\$158/25g \$452/100g \$1,505/500g \$2,007/1kg
<b>Ni</b> 0286JY 7440-02-0 UN3089 Flammable	Nickel Powder, 99.9+% (metal basis, O<10%) APS: 20 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$72/5g \$132/25g \$390/100g \$1,369/500g \$2,601/1kg
<b>Ni</b> 0287JY 7440-02-0 UN3089 Flammable	Nickel Powder (carbon coated), 99.9+% (metal basis, O<10%) APS: 20 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$79/5g \$143/25g \$429/100g \$1,507/500g \$2,860/1kg
<b>Si</b> 0140JS 7440-21-3 UN3089 4.1 III Flammable	Silicon (Si) Purity: > 98% APS: 50 -70 nm (max<~~100nm) SSA: 30-50 m <sup>2</sup> /g	\$365/50g \$585/100g \$1,985/500g \$2,950/1kg negotiable/10kg negotiable/100kg
<b>Si</b> 0141JS 7440-21-3 UN3089 4.1 III Flammable	Silicon (Si) Purity: > 98% APS: 30 - 50 nm SSA: 70-80 m <sup>2</sup> /g	\$485/50g \$785/100g \$2,660/500g \$3,950/1kg
<b>Si</b> 0142JS 7440-21-3 UN3089 4.1 III Flammable	Silicon (Si) Purity: > 98% APS: 20 - 30 nm	\$535/50g \$865/100g \$2,960/500g \$4,450/1kg
<b>Si</b> 0142KE 7440-21-3 UN3089 4.1 III Flammable	Silicon (Si) 99.5% APS: 130 nm Nanowires present	\$220/100g \$882/500g \$1324/1kg
<b>Ti</b> 0223HW 7440-32-6 UN2546 Flammable	Titanium (Ti) Purity: 99% APS: 30-50 nm SSA: 12 m <sup>2</sup> /g Color: Morphology: True density: 4.506 g/cm <sup>3</sup>	\$324/25g \$907/100g \$2,431/500g \$3,850/1kg
<b>Zn</b> 0303HW 7440-66-6 UN1436 Flammable	Zinc (Zn) Purity: 99.5% APS: 130 nm SSA: 5-7 m <sup>2</sup> /g Color: gray	\$88/25g \$229/100g \$756/500g \$1,287/1kg

	Morphology: spherical	
<b>Zn</b> 0304HW 7440-66-6 UN1436 Flammable	Zinc (Zn) Purity: 99.5% APS: 80 nm	\$95/25g \$205/100g \$892/500g \$1544/1kg
<b>Zn</b> 0306JY 7440-66-6 UN1436 Flammable	Zinc Powder, 99.9+% (metal basis, O<10%) APS: 100 nm SSA: 30-50 m <sup>2</sup> /g Particle Morphology: faceted Crystallographic Structure: hexagonal	\$143/25g \$429/100g \$1,507/500g \$2,860/1kg

## 2. Carbon Nanotubes and Nanofibers

Formula Stock # CAS #	Abbreviations used in this catalog  APS: Average Particle Size, ACS: Average Crystallite Size , OD: Outside Diameter, ID: Inside Diameter SSA: Specific Surface Area.	Price (US\$/quantity)
<b>C</b> 1188JN 7440-44-0	<b>Graphitized Carbon nanofibers</b> , 95% OD: 200-500 nm, ID: 1.0-10 nm, Length: 10-40 um SSA: ~25 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$85/5g \$170/25g \$594/100g \$2,377/500g
<b>C</b> 1290NMG 7440-44-0	<b>Double-walled carbon nanotubes (DWNs)</b> Purity: 90+% CNTs, 50+% DWNs Outside Diameter: 1.3-5 nm, Length: 5-15 um SSA: ~ 400 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$130/1g \$480/5g \$1600/25g \$4500/100g \$14000/500g \$25000/1kg
<b>C</b> 1291NMG 7440-44-0	<b>Double-walled carbon nanotubes (DWNs)</b> Purity: 90+% CNTs, 20+% DWNs Outside Diameter: 1.3-5 nm, Length: 5-15 um SSA: ~ 400 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$90/1g \$250/5g \$520/25g \$1200/100g
<b>C</b> 1201YJ 7440-44-0	<b>Industrial-grade multi-walled carbon nanotubes (MWNTs)</b> , 88+% OD: 10-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 100-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$428/1kg \$3,800/10kg
<b>C</b> 1202YJ 7440-44-0	<b>Industrial-grade multi-walled carbon nanotubes (MWNTs)</b> , 88+% OD: 20-40 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$405/1kg \$3,565/10kg
<b>C</b> 1206YJ 7440-44-0	<b>Industrial-grade multi-walled carbon nanotubes (MWNTs)</b> , 88+% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$380/1kg \$3,325/10kg
<b>C</b> 1219YJ 7440-44-0	<b>Graphitized multi-walled carbon nanotubes (MWNTs)</b> , 99.9+% OD: 8-15 nm, ID: 3-5 nm, Length: ~ 50 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$89/1g \$165/5g \$470/25g \$1,300/100g

		\$4,500/500g
<b>C</b> 1220YJ 7440-44-0	<b>Graphitized multi-walled carbon nanotubes (MWNTs), 99.9+%</b> OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1221YJ 7440-44-0	<b>Graphitized multi-walled carbon nanotubes (MWNTs), 99.9+%</b> OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1222YJ 7440-44-0	<b>Graphitized multi-walled carbon nanotubes (MWNTs), 99.9+%</b> OD: 30-50 nm, ID: 5-12 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1223YJ 7440-44-0	<b>Graphitized multi-walled carbon nanotubes (MWNTs), 99.9+%</b> OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 80-m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1203YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: ≤ 8 nm, ID: 2-5 nm, Length: 10-30 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$99/5g \$175/25g \$450/100g \$1450/500g
<b>C</b> 1225YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: ≤ 8 nm, ID: 2-5 nm, Length: 0.5-2 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$140/5g \$420/25g \$990/100g \$2500/500g
<b>C</b> 1226NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: ≤ 10 nm, ID: 2-7 nm, Length: 5-15 um SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$87/5g \$190/25g \$625/100g \$2,115/500g \$4,010/1kg
<b>C</b> 1215NMGA 7440-44-0	<b>Aligned Multi-walled carbon nanotubes (MWNTs),</b> Purity: 95+% OD: 10±3 nm, ID: 2-7 nm, Length: 5-15 um SSA: 40-300 m <sup>2</sup> /g Particle Morphology: long aligned tubes Crystallographic Structure: cylindrical graphitic	\$115/5g \$275/25g \$860/100g \$2,750/500g \$4,520/1kg
<b>C</b> 1204YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: 8-15 nm, ID: 3-5 nm, Length: 10-50 um SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$85/5g \$150/25g \$390/100g
<b>C</b> 1235YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: 8-15 nm, ID: 3-5 nm, Length: 0.5-2 μm SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$135/5g \$390/25g \$950/100g \$2500/500g
<b>C</b> 1205YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs), 95+%</b> OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$70/5g \$160/25g \$350/100g \$1100/500g

<b>C</b> 1236YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 10-20 nm, ID: 5-10 nm, Length: 0.5-2 $\mu$ m SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$135/5g \$390/25g \$950/100g \$2500/500g
<b>C</b> 1212TY 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 90+% OD: 10-30 nm, ID: 3-10 nm, Length: 1-10 $\mu$ m SSA: ~ 200 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$94/5g \$234/25g \$772/100g \$2,626/500g \$4,990 /1kg
<b>C</b> 1228NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 10-30 nm, ID: 5-10 nm, Length: 5-15 $\mu$ m SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$76/5g \$123/25g \$403/100g \$1,369/500g \$2,610/1kg
<b>C</b> 1213NMGS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 10-30 nm, ID: 5-10 nm, Length: 1-2 $\mu$ m SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$77/5g \$124/25g \$404/100g \$1,370/500g \$2,620/1kg
<b>C</b> 1229YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 $\mu$ m SSA: 110-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$65/5g \$110/25g \$210/100g \$420/500g
<b>C</b> 1237YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 20-30 nm, ID: 5-10 nm, Length: 0.5-2 $\mu$ m SSA: 110-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$135/5g \$390/25g \$950/100g \$2500/500g
<b>C</b> 1230NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 20-40 nm, ID: 5-10 nm, Length: 5-15 $\mu$ m SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$78/5g \$125/25g \$405/100g \$1,371/500g \$2,630/1kg
<b>C</b> 1214NMGS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 20-40 nm, ID: 5-10 nm, Length: 1-2 $\mu$ m SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$79/5g \$126/25g \$406/100g \$1,372/500g \$2,640/1kg
<b>C</b> 1231YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 30-50 nm, ID: 5-15 nm, Length: 10-20 $\mu$ m SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$60/5g \$99/25g \$190/100g \$410/500g
<b>C</b> 1238YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 30-50 nm, ID: 5-15 nm, Length: 0.5-2 $\mu$ m SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$135/5g \$390/25g \$950/100g \$2500/500g
<b>C</b> 1232NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 40-60 nm, ID: 5-10 nm, Length: 5-15 $\mu$ m SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$80/5g \$127/25g \$407/100g \$1,373/500g \$2,650/1kg
<b>C</b> 1258NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95% OD: 40-60 nm, Length: 1-2 $\mu$ m SSA: 60-70 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$79/5g \$126/25g \$406/100g
<b>C</b> 1233YJ 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 $\mu$ m SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$190/100g

<b>C</b> 1227YJS 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 50-80 nm, ID: 5-15 nm, Length: 0.5-2 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$135/5g \$390/25g \$950/100g \$2500/500g
<b>C</b> 1234NMG 7440-44-0	<b>Multi-walled carbon nanotubes (MWNTs)</b> , 95+% OD: 60-100 nm, ID: 5-10 nm, Length: 5-15 um SSA: 40-600 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/5g \$128/25g \$408/100g \$1,374/500g \$2,660/1kg
<b>C</b> 1280NMG 7440-44-0	<b>Single-walled carbon nanotubes (SWNTs)</b> Purity: 90+% CNTs, 50+% SWNTs Average Diameter: 1.1 nm, Length: 5-15 um SSA: 400 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$150/1g \$390/5g \$1300/25g \$3200/100g
<b>C</b> 1281YJS 7440-44-0	<b>Single-walled carbon nanotubes (SWNTs)</b> Purity: 90% CNTs, 60% SWNTs Average Diameter: 1.1 nm, Length: 0.5-2 μm SSA: 360-400 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$120/1g \$450/5g \$1,150/25g
<b>C</b> 1283YJ 7440-44-0	<b>Single-walled carbon nanotubes (SWNTs)</b> Purity: 90% CNTs, 60% SWNTs Average Diameter: 1-2 nm, Length: 5-30 um SSA: 360-400 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$105/1g \$338/5g \$900/25g \$2,995/100g
<b>C</b> 1284YJ 7440-44-0	<b>Single-walled carbon nanotubes (SWNTs)</b> Purity: 95% CNTs, 90% SWNTs Average Diameter: 1-2 nm, Length: 5-30 um SSA: 300-380 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$165/1g \$788/5g \$2,100/25g \$7,790/100g
<b>C</b> 1246YJS 7440-44-0	<b>Short-length single-walled carbon nanotubes (SWNTs)</b> Purity: 95% CNTs, 90% SWNTs Average Diameter: 1-2 nm, Length: 1-3 um SSA: 300-380 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$220/1g \$980/5g \$2,950/25g
<b>C</b> 1207YJF 7440-44-0	<b>-OH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 88+% Content of -OH: 2.36-2.60 wt% OD: 10-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 100-130 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$448/1kg \$4,000/10kg
<b>C</b> 1208YJF 7440-44-0	<b>-OH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 88+% Content of -OH: 1.55-1.71 wt% OD: 20-40 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-120 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$433/1kg \$3,850/10kg
<b>C</b> 1209YJF 7440-44-0	<b>-OH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 88+% Content of -OH: 0.72-0.79 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$433/1kg \$3,850/10kg

<b>C</b> 1224YJF 7440-44-0	<b>-OH functionalized graphitized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 99.9+% Content of -OH: 1.76-1.94 wt% OD: 8-15 nm, ID: 3-5 nm, Length: ~50 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$96/1g \$180/5g \$490/25g \$1,400/100g \$5,500/500g
<b>C</b> 1228YJF 7440-44-0	<b>-OH functionalized graphitized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 99.9+% Content of -OH: 1.45-1.61 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1235YJF 7440-44-0	<b>-OH functionalized graphitized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 99.9+% Content of -OH: 0.84-0.92 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1239YJF 7440-44-0	<b>-OH functionalized graphitized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 99.9+% Content of -OH: 0.50-0.56 wt% OD: 30-50 nm, ID: 5-12 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1240YJF 7440-44-0	<b>-OH functionalized graphitized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 99.9+% Content of -OH: 0.34-0.38 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 50-70 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1261YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 5.30-5.86 wt% OD: ≤ 8 nm, ID: 2-5 nm, Length: 10-30 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1262YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 3.52-3.89 wt% OD: 8-15 nm, ID: 3-5 nm, Length: 10-50 um SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$123/5g \$307/25g \$1,044/100g \$3,600/500g
<b>C</b> 1263YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 2.91-3.21 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$75/1g \$110/5g \$205/25g \$750/100g \$2,500/500g
<b>C</b> 1264YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 1.67-1.85 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 110-130 m <sup>2</sup> /g	\$110/5g \$205/25g \$750/100g \$2,500/500g

	Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	
<b>C</b> 1265YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 1.0-1.11 wt% OD: 30-50 nm, ID: 5-15 nm, Length: 10-20 um SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$110/5g \$205/25g \$750/100g \$2,500/500g
<b>C</b> 1266YJF 7440-44-0	<b>-OH functionalized multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 0.67-0.75 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$99/5g \$150/25g \$350/100g \$990/500g
<b>C</b> 1247YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 5.30-5.86 wt% OD: < 8 nm, ID: 2-5 nm, Length: 0.5-2 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$86/1g \$150/5g \$390/25g \$1,200/100g \$4,200/500g
<b>C</b> 1248YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 3.52-3.89 wt% OD: 8-15 nm, ID: 3-5 nm, Length: 0.5-2 um SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1249YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 2.91-3.21 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 0.5-2 um SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1251YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 1.67-1.85 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 0.5-2 um SSA: 110-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1252YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 1.0-1.11 wt% OD: 30-50 nm, ID: 5-12 nm, Length: 0.5-2 um SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1253YJF 7440-44-0	<b>-OH functionalized short multi-walled carbon nanotubes (MWNTs-OH)</b> Content of MWNTs (excluding -OH): 95+% Content of -OH: 0.67-0.75 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 0.5-2 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1285YJF 7440-44-0	<b>-OH functionalized Single-walled carbon nanotubes (SWNTs-OH)</b> Purity (excluding -OH): 90% CNTs, 60% SWNTs Content of -OH: 3.76-4.16 wt% Average Diameter: 1-2 nm, Length: 5-30 um SSA: 360-400 m <sup>2</sup> /g Particle Morphology: long bundled tubes	\$176/1g \$570/5g \$1,510/25g \$4,998/100g

	Crystallographic Structure: cylindrical graphitic	
<b>C</b> 1286YJF 7440-44-0	<b>-OH functionalized Single-walled carbon nanotubes (SWNTs-OH)</b> Purity (excluding -OH): 95% CNTs, 90% SWNTs Content of -OH: 3.76-4.16 wt% Average Diameter: 1-2 nm, Length: 5-30 um SSA: 300-380 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$220/1g \$890/5g \$2,500/25g \$8,500/100g
<b>C</b> 1210YJF 7440-44-0	<b>-COOH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 88+% Content of -COOH: 1.47-1.63 wt% OD: 10-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 100-130 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$448/1kg \$4,000/10kg
<b>C</b> 1216YJF 7440-44-0	<b>-COOH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 88+% Content of -COOH: 1.36-1.50 wt% OD: 20-40 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-120 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$433/1kg \$3,850/10kg
<b>C</b> 1218YJF 7440-44-0	<b>-COOH functionalized industrial-grade multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 88+% Content of -COOH: 0.48-0.54 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$433/1kg \$3,850/10kg
<b>C</b> 1241YJF 7440-44-0	<b>-COOH functionalized graphitized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 99.9+% Content of -COOH: 1.22-1.34 wt% OD: 8-15 nm, ID: 3-5 nm, Length: ~50 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$96/1g \$180/5g \$490/25g \$1,400/100g \$5,500/500g
<b>C</b> 1242YJF 7440-44-0	<b>-COOH functionalized graphitized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 99.9+% Content of -COOH: 0.95-1.05 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1243YJF 7440-44-0	<b>-COOH functionalized graphitized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 99.9+% Content of -COOH: 0.58-0.64 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 80-100 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1244YJF 7440-44-0	<b>-COOH functionalized graphitized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 99.9+% Content of -COOH: 0.34-0.38 wt% OD: 30-50 nm, ID: 5-12 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g

	Crystallographic Structure: cylindrical graphitic	
<b>C</b> 1245YJF 7440-44-0	<b>-COOH functionalized graphitized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 99.9+% Content of -COOH: 0.24-0.26 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 50-70m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1267YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 3.67-4.05 wt% OD: ≤ 8 nm, ID: 2-5 nm, Length: 10-30 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$69/1g \$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1268YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 2.43-2.67 wt% OD: 8-15 nm, ID: 3-5 nm, Length: 10-50 um SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$110/5g \$350/25g \$1080/100g \$3600/500g
<b>C</b> 1269YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 1.9-2.1 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 10-30 um SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$110/5g \$205/25g \$750/100g \$2,500/500g
<b>C</b> 1270YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 1.17-1.29 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 10-30 um SSA: 110-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$110/5g \$205/25g \$750/100g \$2,500/500g
<b>C</b> 1271YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 0.69-0.77 wt% OD: 30-50 nm, ID: 5-15 nm, Length: 10-20 um SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$110/5g \$205/25g \$750/100g \$2,500/500g
<b>C</b> 1272YJF 7440-44-0	<b>-COOH functionalized multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+% Content of -COOH: 0.47-0.51 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 10-20 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$99/5g \$150/25g \$350/100g \$990/500g
<b>C</b> 1287YJF 7440-44-0	<b>-COOH functionalized Single-walled carbon nanotubes (SWNTs-COOH)</b> Purity (excluding -COOH): 90% CNTs, 60% SWNTs Content of -COOH: 2.59-2.87 wt% Average Diameter: 1-2 nm, Length: 5-30 um SSA: 360-400 m <sup>2</sup> /g	\$150/1g \$450/5g \$1,100/25g \$3,900/100g

	Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	
<b>C</b> 1288YJF 7440-44-0	<b>-COOH functionalized Single-walled carbon nanotubes (SWNTs-COOH)</b> Purity (excluding -COOH): 95% CNTs, 90% SWNTs Content of -COOH: 2.59-2.87 wt% Average Diameter: 1-2 nm, Length: 5-30 um SSA: 300-380 m <sup>2</sup> /g Particle Morphology: long bundled tubes Crystallographic Structure: cylindrical graphitic	\$199/1g \$840/5g \$2,500/25g \$8,900/100g
<b>C</b> 1254YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 3.67-4.05 wt% OD: < 8 nm, ID: 2-5 nm, Length: 0.5-2 um SSA: 350-420 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$86/1g \$150/5g \$390/25g \$1,200/100g \$4,200/500g
<b>C</b> 1255YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 2.43-2.67 wt% OD: 8-15 nm, ID: 3-5 nm, Length: 0.5-2 um SSA: 180-240 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1256YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 1.9-2.1 wt% OD: 10-20 nm, ID: 5-10 nm, Length: 0.5-2 um SSA: 180-230 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1257YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 1.17-1.29 wt% OD: 20-30 nm, ID: 5-10 nm, Length: 0.5-2 um SSA: 110-130 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1259YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 0.69-0.77 wt% OD: 30-50 nm, ID: 5-12 nm, Length: 0.5-2 um SSA: 90-120 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1273YJF 7440-44-0	<b>-COOH functionalized short multi-walled carbon nanotubes (MWNTs-COOH)</b> Content of MWNTs (excluding -COOH): 95+ % Content of -COOH: 0.47-0.51 wt% OD: 50-80 nm, ID: 5-15 nm, Length: 0.5-2 um SSA: 60-80 m <sup>2</sup> /g Particle Morphology: long tube Crystallographic Structure: cylindrical graphitic	\$81/1g \$140/5g \$350/25g \$1,100/100g \$4,100/500g
<b>C</b> 1292YJ 7440-44-0	<b>Highly conductive multi-walled carbon nanotubes</b> Purity: 95+ % Outside diameter: 50-100 nm Inside diameter: 5-10 nm Length: 5-10 um Particle Morphology: long bundled tubes	\$120/25g \$398/100g \$1,328/500g \$2,500/1kg Quote/10kg+

	Crystallographic Structure: cylindrical graphitic	
<b>C/Ni</b> 1293YJ 7440-44-0/ 7440-02-0 UN3089 Flammable	<b>Nickel(60 wt%)-coated multi-walled carbon nanotubes</b> ~ 60 wt% Nickel + ~ 38 wt% carbon nanotubes CNT OD: 8-15 nm CNT ID: 3-5 nm CNT length 10-50 um CNT SSA: ~ 230 m <sup>2</sup> /g	\$180/5g \$630/25g \$1,575/100g
<b>C/Ni</b> 1294YJ 7440-44-0/ 7440-02-0 UN3089 Flammable	<b>Nickel(60 wt%)-coated multi-walled carbon nanotubes</b> ~ 60 wt% Nickel + ~ 38 wt% carbon nanotubes CNT OD: 10-20 nm CNT ID: 5-10 nm CNT length: 10-30 um CNT SSA: ~ 200-350 m <sup>2</sup> /g	\$160/5g \$560/25g \$1,400/100g
<b>C/Ni</b> 1295YJ 7440-44-0/ 7440-02-0 UN3089 Flammable	<b>Nickel(60 wt%)-coated multi-walled carbon nanotubes</b> ~ 60 wt% Nickel + ~ 38 wt% carbon nanotubes CNT OD: 20-30 nm CNT ID: 5-10 nm CNT length: 10-30 um CNT SSA: ~ 110 m <sup>2</sup> /g	\$160/5g \$560/25g \$1,400/100g
<b>C/Ni</b> 1296YJ 7440-44-0/ 7440-02-0 UN3089 Flammable	<b>Nickel(60 wt%)-coated multi-walled carbon nanotubes</b> ~ 60 wt% Nickel + ~ 38 wt% carbon nanotubes CNT OD: 30-50 nm CNT ID: 5-15 nm CNT length: 10-20 um CNT SSA: ~ 60 m <sup>2</sup> /g	\$140/5g \$500/25g \$1,245/100g
<b>C/Ni</b> 1297YJ 7440-44-0/ 7440-02-0 UN3089 Flammable	<b>Nickel(60 wt%)-coated multi-walled carbon nanotubes</b> ~ 60 wt% Nickel + ~ 38 wt% carbon nanotubes CNT OD: 50-80 nm CNT ID: 5-15 nm CNT length: 10-20 um CNT SSA: ~ 40 m <sup>2</sup> /g	\$140/5g \$500/25g \$1,245/100g
<b>C</b> 1298YJ 7440-44-0	<b>Coiled multi-walled carbon nanotubes</b> CNT purity: > 95% CNT OD: 50-150 nm CNT length: 5-10 um CNT SSA: > 50 m <sup>2</sup> /g	\$70/g \$225/5g \$600/25g \$1,990/100g
<b>C</b> 1217QW01 7440-44-0	<b>Vertically aligned multi-walled carbon nanotube (CNT) arrays on silicon substrate</b> CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm CNT length: 10-50 um Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	\$500/1 cm x 1 cm square \$650/1.5 cm x 1.5 cm square \$835/2 cm x 2 cm square \$1250/3 cm x 3 cm square \$1500/dia. 2-inch disk
<b>C</b> 1217QW02 7440-44-0	<b>Vertically aligned multi-walled carbon nanotube (CNT) arrays on silicon substrate</b> CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm CNT length: 100-300 um Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	\$500/1 cm x 1 cm square \$650/1.5 cm x 1.5 cm square \$835/2 cm x 2 cm square \$1250/3 cm x 3 cm square \$1500/dia. 2-inch disk
<b>C</b> 1217QW03 7440-44-0	<b>Carbon nanotube arrays on silicon (OD 7-10 nm, L 1.1mm )</b> Vertically aligned multi-walled carbon nanotube (CNT) arrays on silicon substrate CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm	\$500/1 cm x 1 cm square \$650/1.5 cm x 1.5 cm square \$835/2 cm x 2 cm square \$1250/3 cm x 3 cm

	CNT length: 1.1mm Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	square \$1500/dia. 2-inch disk \$1600/dia. 4-inch disk
<b>C</b> 1217QW04 7440-44-0	<b>Vertically aligned multi-walled carbon nanotube (CNT) arrays on quartz substrate</b> CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm CNT length: 10-50 um Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	\$530/1 cm x 1 cm square \$680/1.5 cm x 1.5 cm square \$865/2 cm x 2 cm square \$1280/3 cm x 3 cm square \$1530/dia. 2-inch disk
<b>C</b> 1217QW05 7440-44-0	<b>Vertically aligned multi-walled carbon nanotube (CNT) arrays on quartz substrate</b> CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm CNT length: 100-300 um Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	\$530/1 cm x 1 cm square \$680/1.5 cm x 1.5 cm square \$865/2 cm x 2 cm square \$1280/3 cm x 3 cm square \$1530/dia. 2-inch disk
<b>C</b> 1217QW06 7440-44-0	<b>Vertically aligned multi-walled carbon nanotube (CNT) arrays on quartz substrate</b> CNT purity: > 99% CNT OD: 7-10 nm CNT ID: 5-8 nm CNT length: 1-1.5 mm Carbon nanotube site density: 10 <sup>10</sup> -10 <sup>11</sup> nanotubes/cm <sup>2</sup> (distance between two adjacent CNTs ~ 200-300 nm)	\$500/1 cm x 1 cm square \$650/1.5 cm x 1.5 cm square \$835/2 cm x 2 cm square \$1250/3 cm x 3 cm square \$1500/dia. 2-inch disk

### 3. Non-Oxide Nanoparticles

<b>AlN</b> 1002HW 24304-00-5 UN 2813 Water reactive solid	Aluminum Nitride Powder, 99.5% APS: 70-80 nm	\$260/100g \$867/500g \$1084/1kg
<b>BN</b> 1180YL 10043-11-5	Boron Nitride Powder, 99% APS: 137 nm SSA: 19.4 m <sup>2</sup> /g Particle Morphology: irregular Crystallographic Structure: hexagonal	\$178/25g \$440/100g \$1,598/500g \$2,680/1kg
<b>BN</b> 1182HW 10043-11-5	Boron Nitride Powder, 99.8% APS: 0.6~1.2 um Crystallographic Structure: hexagonal	\$66/25g \$98/100g \$228/500g \$381/1kg
<b>SiC</b> 4621HW 409-21-2	Silicon Carbide (beta) Powder, 95+% APS: 50-60 nm Particle Morphology: spherical	\$82/25g \$113/100g \$305/500g \$548/1kg \$3913/10kg

<b>SiC</b> 4620KE 409-21-2	Purity: 97.5% Average particle size: 45-55 nm Color: Grayish white Density, bulk: 0.068 g/cm <sup>3</sup> Density, true: 3.22 g/cm <sup>3</sup> Morphology: Spherical Synthesis method: Plasma CVD	\$131/100g \$228/300g \$408/500g \$638/1kg
<b>SiC</b> 4631JS 409-21-2	Silicon Carbide (beta) Powder, 97+% APS: 10 nm SSA: 150-200 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$285/50g \$685/100g \$2,085/500g \$3,150/1kg
<b>SiC</b> 4632YD 409-21-2	Silicon Carbide (amorphous) Powder, 99+% APS: 15 nm SSA: ~ 90 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: amorphous	\$370/25g \$1,075/100g \$3,275/500g \$4,950/1kg
<b>SiC</b> 4622HW 409-21-2	Silicon Carbide Nanowhisker (beta SiC, 99+%) Free Carbon <0.05% Diameter: 0.1-2.5 um Length: ≥ 2.0-50 um Crystal Type: Beta Decomposition Temperature: 2973 K Density (288K): 3.216 g/cm <sup>3</sup> Hardness(Mohs): 9.5	\$130/25g \$371/100g \$1235/500g \$1647/1kg
<b>Si<sub>3</sub>N<sub>4</sub></b> 4750KE 12033-89-5	Silicon Nitride Powder, 98.5+% APS: 15-30 nm SSA: 103-123 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: amorphous	\$118/100g \$294/500g \$459/1kg \$3,950/10kg
<b>TiB<sub>2</sub></b> 5180HW 12045-63-5	Titanium Boride Powder, 98% APS: 2-12 um	\$78/100g \$198/500g \$295/1kg
<b>TiC</b> 5216KE 12070-08-5 UN3178, Flammable	Titanium Carbide Powder, 98+% APS: 40 nm SSA: ~ 40 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$152/100g \$585/500g \$783/1kg
<b>TiC</b> 5217KE 12070-08-5 UN3178, Flammable	Titanium Carbide Powder, 99% APS: 80-130 nm SSA: ~ 35 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$110/25g \$177/100g \$553/500g \$892/1kg
<b>TiN</b> 5350KE 25583-20-4 UN3178, Flammable	Titanium nitride (TiN) Purity: > 97% APS: 20 nm SSA: 40-55 m <sup>2</sup> /g Color: black Morphology: spherical	\$176/100g \$590/500g \$1,150/1kg
<b>WC</b> 5550ZN 12070-12-1 UN3178 Flammable	Tungsten Carbide Powder, 99.5% APS: 90-300 nm SSA: 1.1 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: hexagonal	\$70/25g \$110/100g \$250/500g \$360/1kg \$2,500/10kg
<b>WC/Co</b> 5560ZN8 12070-12-1 UN3178	Tungsten-Carbide/Cobalt (Co=8wt%) Powder, 99.5% APS: 60-250 nm SSA: 1.5 m <sup>2</sup> /g Particle Morphology: nearly spherical	\$90/25g \$155/100g \$350/500g \$495/1kg

Flammable	Crystallographic Structure: hexagonal (WC), cubic(Co)	\$3,500/10kg
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#### 4. Oxide Nanoparticles

<b>Al<sub>2</sub>O<sub>3</sub></b> 1005MR 1344-28-1	Aluminum Oxide (alpha) Powder, 99.97% APS: 150 nm SSA: 5-15 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: rhombohedral	\$70/100g \$120/500g \$180/1kg \$1,620/10kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 1015WW 1344-28-1	Aluminum Oxide Powder, 99.5% (mainly alpha, contains 5-10% gamma) APS: 27-43 nm SSA: 35 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: rhombohedral	\$75/100g \$140/500g \$200/1kg \$1,660/10kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 1040LQS 1344-28-1	Aluminum Oxide Powder (alpha), 99.9% APS: 200 nm SSA: 3.9 m <sup>2</sup> /g Particle Morphology: spherical	\$80/100g \$170/500g \$240/1kg \$1,820/10kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 1020MR 1344-28-1	Aluminum Oxide (gamma) Powder, 99.97% APS: 20-30 nm SSA: 180 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$80/100g \$140/500g \$210/1kg \$1,820/10kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 1041HT 1344-28-1	Aluminum Oxide (gamma) Powder, 99% APS: 10 nm SSA: >160 m <sup>2</sup> /g Particle Morphology: nearly spherical	\$68/100g \$160/500g \$230/1kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 1042HT 1344-28-1	Aluminum Oxide (gamma) Powder, Al <sub>2</sub> O <sub>3</sub> , 99% APS: 20 nm Particle Morphology: nearly spherical	\$80/100g \$140/500g \$210/1kg
<b>Al(OH)<sub>3</sub></b> 1040WJ 21645-51-2	Aluminum Hydroxide (Al(OH) <sub>3</sub> , 99.5 %, 50nm) Water absorption 5.5±0.5 ml/20g	\$180/500g \$1400/5kg
<b>B<sub>2</sub>O<sub>3</sub></b> 1185DF 1303-86-2	Boron Oxide Powder, 98% APS: 40-80 nm SSA: 35 m <sup>2</sup> /g Particle Morphology: spherical	\$461/25g \$1,319/100g \$4,395/500g
<b>BaFe<sub>12</sub>O<sub>19</sub></b> 1145FY 12047-11-9	Barium Iron Oxide Powder, 99.5% APS: 500 nm Particle Morphology: polyhedral Crystallographic Structure: hexagonal	\$80/100g \$160/500g \$240/1kg \$1,680/10kg
<b>BaSO<sub>4</sub></b> 1142ZJ 7727-43-7	Barium Sulfate Powder, 99% APS: 1-5 um Particle Morphology: irregular Crystallographic Structure: orthorhombic	\$65/25g \$85/100g \$115/500g \$155/1kg \$945/10kg
<b>BaTiO<sub>3</sub></b> 1147DY 12047-27-7	Barium Titanate Powder, 99.9% (BaO/TiO <sub>2</sub> : 0.999 - 1.001) APS: 500 nm (determined from SEM) SSA: 2.0-2.2 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$85/100g \$188/500g \$280/1kg

<b>BaTiO<sub>3</sub></b> 1146DY 12047-27-7	Barium Titanate Powder, 99.9% (BaO/TiO <sub>2</sub> : 0.999 - 1.001) APS: 400 nm (determined from SEM) SSA: 2.6-2.8 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$85/100g \$188/500g \$280/1kg
<b>BaTiO<sub>3</sub></b> 1144DY 12047-27-7	Barium Titanate Powder, 99.9% (BaO/TiO <sub>2</sub> : 0.999 - 1.001) APS: 300 nm (determined from SEM) SSA: 3.5-3.7 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$85/100g \$188/500g \$280/1kg
<b>BaTiO<sub>3</sub></b> 1148DY 12047-27-7	Barium Titanate Powder, 99.9% (BaO/TiO <sub>2</sub> : 0.999 - 1.001) APS: 200 nm (determined from SEM) SSA: 5.0-5.6 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$85/100g \$188/500g \$280/1kg
<b>BaTiO<sub>3</sub></b> 1143DY 12047-27-7	Barium Titanate Powder, 99.9% (BaO/TiO <sub>2</sub> : 0.999 - 1.001) APS: 100 nm (determined from SEM) SSA: 10-11 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$85/100g \$188/500g \$280/1kg
<b>CeO<sub>2</sub></b> 1406RE 1306-38-3	Cerium Oxide Powder, 99.9% (REO) APS: 15-30 nm SSA: 30-50 m <sup>2</sup> /g Color: pale yellow Morphology: spherical Bulk density: < 0.2 g/cm <sup>3</sup> True density: 7.132 g/cm <sup>3</sup> Mfg. method: sol-gel	\$125/100g \$375/500g
<b>CeO<sub>2</sub></b> 1450YS 1306-38-3	Cerium Oxide Powder, 99.9% (REO) APS: 50-105 nm SSA: 8-15 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$115/100g \$355/500g
<b>CoFe<sub>2</sub>O<sub>4</sub></b> 1510FY 12052-28-7	Cobalt Iron Oxide Powder, 98% APS: 35-55 nm Particle Morphology: spherical Crystallographic Structure: cubic	\$90/25g \$145/100g \$395/500g \$625/1kg \$4,375/10kg
<b>Co<sub>0.5</sub>Zn<sub>0.5</sub>Fe<sub>2</sub>O<sub>4</sub></b> 1515FY	Cobalt-Zinc Iron Oxide Powder, 98.5% APS: 15-30 nm Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$90/25g \$145/100g \$395/500g \$625/1kg \$4,375/10kg
<b>CoO</b> 1705YD 1307-96-6	Cobalt (II) Oxide Powder, 99.5% APS: 50 nm	\$99/25g \$290/100g \$790/500g \$1,250/1kg
<b>Co<sub>3</sub>O<sub>4</sub></b> 1710SD 1308-06-1	Cobalt (II,III) Oxide Powder, 99.8% APS: 20-30 nm SSA: 40-70 m <sup>2</sup> /g Particle Morphology: fibrous & spherical Crystallographic Structure: cubic	\$80/25g \$190/90g \$510/350g \$530/400g
<b>Co<sub>3</sub>O<sub>4</sub></b> 1720HT 1308-06-1	Cobalt (II,III) Oxide Powder, 99% APS: 50-80 nm SSA: ~ 10 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$81/100g \$285/500g \$513/1kg
<b>Cr<sub>2</sub>O<sub>3</sub></b> 1910FY 1308-38-9	Chromium Oxide Powder, 98% APS: 60 nm Particle Morphology: nearly spherical	\$80/25g \$125/100g \$315/500g

	Crystallographic Structure: rhombohedral	\$450/1kg \$2,950/10kg
<b>CuO</b> 2110FY 1317-38-0	Copper Oxide Powder, 99+% APS: 30-50 nm SSA: 13 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: monoclinic	\$80/100g \$160/500g \$250/1kg \$1,600/10kg
<b>Dy<sub>2</sub>O<sub>3</sub></b> 2252YS 1308-87-8	Dysprosium Oxide Powder, 99.9%(REO) APS: 55 nm SSA: ~ 20 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$205/25g \$643/100g \$2860/500g
<b>Dy<sub>2</sub>O<sub>3</sub></b> 2250YS 1308-87-8	Dysprosium Oxide Powder, 99.9%(REO) APS: (25±5) X (225±25) nm SSA: 18-22 m <sup>2</sup> /g Particle Morphology: fibrous Crystallographic Structure: cubic	\$95/25g \$255/100g \$895/500g
<b>Dy<sub>2</sub>O<sub>3</sub></b> 2251FY 1308-87-8	Dysprosium Oxide Powder, 99.9%(REO) APS: 30 nm Particle Morphology: ~ spherical Crystallographic Structure: cubic	\$125/25g \$380/100g \$1120/500g
<b>Er<sub>2</sub>O<sub>3</sub></b> 2350YS 12061-16-4	Erbium Oxide Powder, 99.9%(REO) APS: 41-53 nm SSA: 13-17 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$85/25g \$182/100g \$510/500g
<b>Er<sub>2</sub>O<sub>3</sub></b> 2310ZQ 12061-16-4	Erbium Oxide (Er <sub>2</sub> O <sub>3</sub> ) Purity: 99.9% (REO) APS: 43 nm (from SSA) SSA: 16 m <sup>2</sup> /g Color: pink Morphology: nearly spherical	\$85/25g \$194/100g \$565/500g
<b>Er<sub>2</sub>O<sub>3</sub></b> 2330RE 12061-16-4	Erbium Oxide Powder, 99.9%(REO/TREO) APS: 20-30 nm Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$85/25g \$190/100g \$538/500g
<b>Eu<sub>2</sub>O<sub>3</sub></b> 2450YS 1308-96-9	Europium Oxide Powder, 99.99%(REO) APS: 45-58 nm (determined from SSA) SSA: 14-18 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$85/5g \$210/25g \$660/100g \$1,610/500g
<b>Eu<sub>2</sub>O<sub>3</sub></b> 2411RE 1308-96-9	Europium Oxide Powder, 99.99%(REO) APS: 30-50 nm SSA: 36 m <sup>2</sup> /g	\$85/5g \$248/25g \$670/100g \$2,040/500g
<b>Eu<sub>2</sub>O<sub>3</sub></b> 2410ZQ 1308-96-9	Europium Oxide Powder, 99.995%(REO) APS: 58 nm (determined from SSA) SSA: 14 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$105/5g \$291/25g \$900/100g \$3,700/500g
<b>Fe<sub>2</sub>O<sub>3</sub></b> 8004NJ 1309-37-1	Iron Oxide (alpha) Nanorods, 99+% Dia: 40-130 nm, Length: 250-600 nm SSA: 50-70 m <sup>2</sup> /g Particle Morphology: nanorods Crystallographic Structure: rhombohedral	\$180/5g \$380/25g \$780/100g \$1,380/500g \$1,980/1kg
<b>Fe<sub>2</sub>O<sub>3</sub></b> 2520TR 1309-37-1	Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> , alpha) Purity: 98+% APS: 20-60 nm SSA: 20-60 m <sup>2</sup> /g Color: red brown Morphology: spherical	\$80/100g \$160/500g \$225/1kg \$1,600/10kg

	Bulk density: True density: 5.24 g/cm <sup>3</sup>	
<b>Fe<sub>2</sub>O<sub>3</sub></b> 2540TR 1309-37-1	Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> , gamma) Purity: 98% APS: 20-30 nm SSA: > 40m <sup>2</sup> /g Morphology: spherical	\$80/100g \$160/500g \$225/1kg \$1,600/10kg
<b>Fe<sub>3</sub>O<sub>4</sub></b> 2652FY 1317-61-9	Iron Oxide Powder, 99.5% APS: 15-20 nm Particle Morphology: spherical Crystallographic Structure: cubic	\$190/100g \$490/500g \$850/1kg \$1,980/10kg
<b>FeOOH</b> 8003NJ 20344-49-4	Iron Hydroxide (alpha) nanorods, 99+% Dia: 50-150 nm, Length: 400-1000 nm SSA: 40-60 m <sup>2</sup> /g Particle Morphology: nanorods	\$180/5g \$380/25g \$780/100g \$1,380/500g \$1,980/1kg
<b>Gd<sub>2</sub>O<sub>3</sub></b> 2680ZQ 12064-62-9	Gadolinium Oxide Powder, 99.9+% (REO) APS: 20-80 nm (from SSA) SSA: 10-40 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$85/25g \$150/100g \$420/500g
<b>Gd<sub>2</sub>O<sub>3</sub></b> 2681RE 12064-62-9	Gadolinium Oxide Powder, 99.9% (REO) APS: 15-30 nm SSA: 30-50 m <sup>2</sup> /g Color: white Bulk density: < 0.2 g/cm <sup>3</sup> True density: 7.407 g/cm <sup>3</sup>	\$105/25g \$150/100g \$365/500g
<b>HfO<sub>2</sub></b> 2695YL 12055-23-1	Hafnium Oxide (HfO <sub>2</sub> ) Purity: 99.99% APS: 100-200 nm, (TEM) SSA: not measured Bulk density: not measured True density: 9.68 g/cm <sup>3</sup>	\$198/25g \$672/100g
<b>In<sub>2</sub>O<sub>3</sub></b> 2710TN 1312-43-2	Indium Oxide Powder, 99.99% APS: 30-50 nm SSA: 15 m <sup>2</sup> /g Particle Morphology: faceted (major) and rod (minor) Crystallographic Structure: cubic	\$130/5g \$240/25g \$605/100g \$1,925/500g \$2,905/1kg
<b>In(OH)<sub>3</sub></b> 2810TN 20661-21-6	Indium Hydroxide Powder, 99.99% APS: 20-70 nm SSA: 12.8 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$72/5g \$107/25g \$299/100g \$988/500g \$1,482/1kg
<b>In<sub>2</sub>O<sub>3</sub>: SnO<sub>2</sub></b> 2730TN 50926-11-9	Indium Tin Oxide (ITO) Powder In <sub>2</sub> O <sub>3</sub> :SnO <sub>2</sub> = 90:10 (wt), 99.99% APS: 30-50 nm SSA: 24 m <sup>2</sup> /g Particle Morphology: irregular Crystallographic Structure: cubic	\$105/5g \$155/25g \$385/100g \$1,140/500g \$1,585/1kg
<b>In<sub>2</sub>O<sub>3</sub>: SnO<sub>2</sub></b> 2731BY 50926-11-9	Indium Tin Oxide (ITO) Powder In <sub>2</sub> O <sub>3</sub> :SnO <sub>2</sub> = 95:5 (wt), 99.99% APS: 30-50 nm SSA: 20-30 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$105/5g \$171/25g \$490/100g \$1,633/500g \$2,177/1kg
<b>La<sub>2</sub>O<sub>3</sub></b> 2920RE 1312-81-8	Lanthanum oxide (La <sub>2</sub> O <sub>3</sub> ) Purity: 99.99% (REO) APS: 15-30 nm SSA: 20-40 m <sup>2</sup> /g Color: white Bulk density: < 0.2 g/cm <sup>3</sup> True density: 6.51 g/cm <sup>3</sup> Mfg. method: sol-gel	\$85/25g \$150/100g \$365/500g

<b>La<sub>0.15</sub>Sr<sub>0.85</sub>MnO<sub>3</sub></b> 5730YD	Lanthanum Strontium Manganate Oxide, 99.5% APS: 35 nm Particle Morphology: spherical	\$390/100g \$1,295/500g \$2,180/1kg
<b>MgO</b> 3305HT 1309-48-4	Magnesium Oxide Powder, ≥ 99% APS: 100 nm SSA: ≥ 7.3 m <sup>2</sup> /g Particle Morphology: polyhedral Crystallographic Structure: cubic	\$80/100g \$160/500g \$225/1kg \$1,600/10kg
<b>MgO</b> 3315HT 1309-48-4	Magnesium Oxide Powder, 99% APS: 20 nm SSA: ≥ 50 m <sup>2</sup> /g Particle Morphology: polyhedral Crystallographic Structure: cubic	\$95/100g \$220/500g \$310/1kg \$2,450/10kg
<b>Mg(OH)<sub>2</sub></b> 3320HT 1309-42-8	Magnesium Hydroxide Powder, 99% APS: 10 nm SSA: ≥ 80 m <sup>2</sup> /g Particle Morphology: polyhedral	\$80/100g \$160/500g \$225/1kg \$1,600/10kg
<b>Mn<sub>2</sub>O<sub>3</sub></b> 8005NJ 1317-34-6	Manganese Oxide Nanorods-Assembled Spheres, epsilon-phase, 99+% Sphere Dia: 0.3 - 1 μm Rod Dia: 5-30 nm Rod Length: 80-100 nm SSA: 200-250 m <sup>2</sup> /g Crystallographic Structure: hexagonal	\$180/5g \$380/25g \$780/100g \$1,380/500g \$1,980/1kg
<b>MoO<sub>3</sub></b> 3851XW 1313-27-5	Molybdenum Oxide Powder, 99.5% APS: 100 nm	\$169/25g \$484/100g \$1,614/500g \$2,152/1kg
<b>Nd<sub>2</sub>O<sub>3</sub></b> 3950YS 1313-97-9	Neodymium Oxide Powder, 99.9% (REO) APS: 49-64 nm (determined from SSA) SSA: 13-17 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: hexagonal	\$85/25g \$150/100g \$360/500g
<b>Nd<sub>2</sub>O<sub>3</sub></b> 3910ZQ 1313-97-9	Neodymium Oxide Powder, 99.9% (REO) APS: 83 nm (determined from SSA) SSA: 10 m <sup>2</sup> /g Particle Morphology: irregular Crystallographic Structure: hexagonal	\$95/25g \$185/100g \$450/500g
<b>Nd<sub>2</sub>O<sub>3</sub></b> 3911RE 1313-97-9	Neodymium Oxide Powder, 99.9% (REO) APS: 15-30 nm SSA: 30-50 m <sup>2</sup> /g Color: pale violet Bulk density: < 0.2 g/cm <sup>3</sup> True density: 7.24 g/cm <sup>3</sup> Mfg. method: sol-gel	\$85/25g \$220/100g \$575/500g
<b>NiFe<sub>2</sub>O<sub>4</sub></b> 4110FY 12168-54-6	Nickel Iron Oxide Powder, 98% APS: 20-30 nm SSA: 59 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$70/25g \$110/100g \$360/500g \$600/1kg \$4,000/10kg
<b>Ni<sub>0.5</sub>Zn<sub>0.5</sub>Fe<sub>2</sub>O<sub>4</sub></b> 4115FY	Nickel-Zinc Iron Oxide Powder, 98.5% APS: 10-30 nm Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$90/25g \$145/100g \$395/500g \$625/1kg \$4,375/10kg
<b>NiO</b> 4205HT 1313-99-1	Nickel(II)Oxide Powder (Ni content = 77.5-78.8%), 99% APS: 100 nm SSA: ≥ 6 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$67/100g \$233/500g \$420/1kg
<b>Pr<sub>6</sub>O<sub>11</sub></b> 4451RE 12037-29-5	Praseodymium(III,IV) Oxide Powder, 99.9% APS: 15-30 nm SSA: 30-50 m <sup>2</sup> /g Bulk density: < 0.2 g/cm <sup>3</sup> True density: 6.5 g/cm <sup>3</sup>	\$105/25g \$220/100g \$575/500g

	Mfg. method: sol-gel	
<b>SiO<sub>2</sub></b> 4830HT 7631-86-9	Silicon Oxide Powder, 99% APS: 80 nm SSA: 440 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: amorphous	\$75/100g \$120/500g \$180/1kg \$1,620/10kg
<b>SiO<sub>2</sub></b> 4860MR 7631-86-9	Silicon Oxide Powder, 99.5% APS: 20 nm SSA: 160±20 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: amorphous	\$75/100g \$120/500g \$180/1kg \$1,620/10kg
<b>SiO<sub>2</sub></b> 4850MR 7631-86-9	Silicon Oxide Powder, 99.5% APS: 15 nm SSA: 640±50 m <sup>2</sup> /g Particle Morphology: spherical, porous Crystallographic Structure: amorphous	\$75/100g \$120/500g \$180/1kg \$1,620/10kg
<b>Sm<sub>2</sub>O<sub>3</sub></b> 4950YS 12060-58-1	Samarium Oxide Powder, 99.9% (REO) APS: 42-55nm (determined from SSA) SSA: 18-22 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$85/25g \$150/100g \$360/500g
<b>Sm<sub>2</sub>O<sub>3</sub></b> 4951RE 12060-58-1	Samarium Oxide Powder, 99.9% (REO) APS: 15-30 nm SSA: 30-50 m <sup>2</sup> /g Color: pale yellow Bulk density: < 0.2 g/cm <sup>3</sup> True density: 8.347g/cm <sup>3</sup> Mfg. method: sol-gel	\$95/25g \$150/100g \$365/500g
<b>SnO<sub>2</sub></b> 5010FY 18282-10-5	Tin Oxide Powder, 99.5% APS: 61 nm (determined from SSA) SSA: 14.2 m <sup>2</sup> /g Particle Morphology: faceted Crystallographic Structure: tetragonal	\$78/100g \$175/500g \$240/1kg
<b>SrAl<sub>12</sub>O<sub>19</sub></b> 5120YD	Strontium Hexaluminate Powder, 99.5% (combustion-synthesized, aggregated) APS: 20-40 nm SSA: ~ 60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: --	\$99/25g \$240/100g \$860/500g \$1,320/1kg
<b>SrTiO<sub>3</sub></b> 5150DY 12060-59-2	Strontium Titanate Powder Purity: 99.8% APS: 100 nm SSA: 11 m <sup>2</sup> /g Morphology: spherical Crystallographic Structure: cubic	\$122/100g \$320/500g \$588/1kg
<b>Tb<sub>4</sub>O<sub>7</sub></b> 5190YS 12037-01-3	Terbium Oxide Powder, 99.95% (REO) APS: 46-60 nm (determined from SSA) SSA: 13-17 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$195/5g \$485/25g \$1,415/100g \$4,210/500g
<b>TiO<sub>2</sub></b> 5420HT 13463-67-7	Titanium Oxide (anatase) Powder, 99% APS: 10-30 nm SSA: 210±10 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$85/100g \$205/500g \$300/1kg \$2,400/10kg
<b>TiO<sub>2</sub></b> 5430MR 13463-67-7	Titanium Oxide (anatase) Powder, 99% APS: 15 nm SSA: 240±50 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$98/100g \$243/500g \$324/1kg

<b>TiO<sub>2</sub></b> 5485MR 13463-67-7	Titanium Oxide (rutile) Powder, 99% APS: 50 nm SSA: 160 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$312/500g \$416/1kg
<b>WO<sub>3</sub></b> 5505YL 1314-35-8	Tungsten Oxide Powder, 99+% APS: 30-70 nm Particle Morphology: nearly spherical Crystallographic Structure: monoclinic	\$78/25g \$190/100g \$480/500g \$798/1kg \$4,880/10kg
<b>WO<sub>3</sub></b> 5507YD 1314-35-8	Tungsten Oxide Powder, 99.5% APS: 60-120 nm Particle Morphology: nearly spherical Crystallographic Structure: monoclinic	\$78/25g \$156/100g \$402/500g \$720/1kg Quote/10kg
<b>Y<sub>2.98</sub>Ce<sub>0.02</sub>Al<sub>5</sub>O<sub>12</sub></b> 5569FY 12005-21-9	Yttrium Aluminum Oxide (YAG) Powder, 99.5% (Cerium doped) APS: 15-40 nm Particle Morphology: spherical Crystallographic Structure: cubic	\$99/25g \$250/100g \$750/500g \$1,200/1kg
<b>Y<sub>2.98</sub>Nd<sub>0.02</sub>Al<sub>5</sub>O<sub>12</sub></b> 5570FY 12005-21-9	Yttrium aluminum oxide, Nd doped (Y <sub>2.98</sub> Nd <sub>0.02</sub> Al <sub>5</sub> O <sub>12</sub> ) Purity: 99.5% APS: 300 nm	\$70/25g
<b>Y<sub>2.98</sub>Nd<sub>0.02</sub>Al<sub>5</sub>O<sub>12</sub></b> 5571FY 12005-21-9	Yttrium Aluminum Oxide (YAG) Powder, 99.5% (Neodymium doped) APS: 40 nm Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$99/25g \$250/100g \$750/500g \$1,200/1kg
<b>Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub></b> 5572FY 12005-21-9	Yttrium Aluminum Oxide (YAG) Powder, 99% APS: 40 nm Particle Morphology: nearly spherical Crystallographic Structure: cubic	\$99/25g \$250/100g \$750/500g \$1,200/1kg
<b>Y<sub>2</sub>O<sub>3</sub></b> 5650YS 1314-36-9	Yttrium Oxide Powder, 99.9% (REO) APS: 32-36 nm (determined from SSA) SSA: 33-37 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$85/25g \$149/100g \$335/500g
<b>Y<sub>2</sub>O<sub>3</sub></b> 5610ZQ 1314-36-9	Yttrium Oxide Powder, 99.995% (REO) APS: 20-40 nm SSA: 42 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$195/25g \$310/100g \$750/500g
<b>Y<sub>2</sub>O<sub>3</sub></b> 5611RE 1314-36-9	Yttrium Oxide Powder, 99.99% (REO) APS: 20-40 nm SSA: 30-50 m <sup>2</sup> /g Color: white Morphology:	\$95/25g \$150/100g \$365/500g
<b>ZnFe<sub>2</sub>O<sub>4</sub></b> 5710FY 12063-19-3	Zinc Iron Oxide Powder, 98.5% APS: 15-30 nm Particle Morphology: spherical Crystallographic Structure: cubic	\$80/25g \$315/500g \$500/1kg
<b>ZnO</b> 5830CD 1314-13-2	Zinc Oxide Powder, 99.9+% APS: 90 nm SSA: 4.9-6.8 m <sup>2</sup> /g Particle Morphology: irregular Crystallographic Structure: hexagonal	\$65/100g \$105/500g \$145/1kg \$1,200/10kg
<b>ZnO</b> 5810HT 1314-13-2	Zinc Oxide Powder, 99.5% APS: 20 nm SSA: 50 m <sup>2</sup> /g Particle Morphology: nearly spherical Crystallographic Structure: hexagonal	\$70/100g \$120/500g \$180/1kg \$1,620/10kg

<b>ZrO<sub>2</sub></b> 5931ZS 1314-23-4	Zirconium Oxide Powder 99.0% (metal basis excluding Hf, Hf < 3 wt%) APS: 20nm SSA: 30-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: monoclinic (~ 95%), tetragonal (~ 5%)	\$75/25g \$120/100g \$290/500g \$395/1kg
<b>ZrO<sub>2</sub> + 3mol% Y<sub>2</sub>O<sub>3</sub></b> 5932HT 64417-98-7	Zirconium Oxide, Yttria Stabilized (ZrO <sub>2</sub> + 3% mol Y <sub>2</sub> O <sub>3</sub> ) Purity: Cryst. phases: mostly tetragonal APS: 40 nm	\$150/500g \$194/1kg
<b>ZrO<sub>2</sub> + 3mol% Y<sub>2</sub>O<sub>3</sub></b> 5932ZS 64417-98-7	Zirconium Oxide Powder, yttria stabilized Purity: 99.9% (metal basis excluding Hf, Hf < 3 wt%) APS: 20-30 nm SSA: 30-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: monoclinic (10-30% vol) and tetragonal (70-90% vol)	\$80/25g \$130/100g
<b>ZrO<sub>2</sub> + 8mol% Y<sub>2</sub>O<sub>3</sub></b> 5970LQA 64417-98-7	Zirconium Oxide Powder, yttria stabilized Purity: 99.9% (metal basis excluding Hf, Hf = 2-3 wt%) APS: 200-300 nm (from SSA, sub-micron <b>aggregate</b> ) SSA: 16-20 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$79/100g \$190/500g
<b>ZrO<sub>2</sub> + 8mol% Y<sub>2</sub>O<sub>3</sub></b> 5933ZS 64417-98-7	Zirconium Oxide Powder, yttria stabilized Purity: 99.9% (metal basis excluding Hf, Hf < 3 wt%) APS: 20-30 nm SSA: 30-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: cubic	\$80/25g \$145/100g
<b>ZrO<sub>2</sub> + 8mol% CaO</b> 5934ZS 64417-98-7	Zirconium Oxide Powder, calcia stabilized Purity: 99.9% (metal basis excluding Hf, Hf < 3 wt%) APS: 20-30 nm SSA: 30-60 m <sup>2</sup> /g Particle Morphology: spherical Crystallographic Structure: tetragonal	\$80/25g \$145/100g \$345/500g \$450/1kg \$3,245/10kg

## 5. Nanoparticles Dispersions

<b>Al<sub>2</sub>O<sub>3</sub></b> 7017WJWA	Aluminum Oxide Dispersion (alpha, 20 wt%, 30 nm) in Water APS: 30 nm Al <sub>2</sub> O <sub>3</sub> Purity: > 99.9% Appearance: white liquid Aluminum Oxide: Al <sub>2</sub> O <sub>3</sub> , gamma, CAS #: 1344-28-1 Water : H <sub>2</sub> O, CAS#: 7732-18-5	\$87/1kg \$736/10kg
<b>Al<sub>2</sub>O<sub>3</sub></b> 7017WJWG	Aluminum Oxide Dispersion (gamma, 20 wt%, 30 nm) in Water APS: 30±10 nm Al <sub>2</sub> O <sub>3</sub> Purity: > 99.9% Appearance: white liquid Aluminum Oxide: Al <sub>2</sub> O <sub>3</sub> , gamma, CAS #: 1344-28-1 Water: H <sub>2</sub> O, CAS#: 7732-18-5	\$122/1kg \$950/10kg
<b>Ag (polymer coated)</b> 7023HZ	Silver nanopowder (polymer coated), 99.99% Particle size: ≤ 15 nm Composition: 10% silver + 90% polymer Dispersibility: dispersible in water and organic solvents Color: black	\$300/25g \$800/100g

<b>Ag (polymer coated) 7024HZ</b>	Silver nanopowder (polymer coated), 99.99% Particle size: $\leq 15$ nm Composition: 25% silver + 75% polymer Dispersibility: dispersible in water and organic solvents Color: black	\$400/25g \$1000/100g
<b>Au (polymer coated) 7021HZ</b>	Gold nanopowder (polymer coated), 99.99% Particle size: $\leq 20$ nm Composition: 10% gold + 90% polymer Dispersibility: dispersible in water and organic solvents Color: dark red	\$3500/100g \$22226/kg
<b>AZO 7029HZ</b>	Name: Aluminum-doped Zinc Oxide AZO Purity: $\geq 99.9\%$ (metal basis) AZO composition: ZnO: Al <sub>2</sub> O <sub>3</sub> = 98:2 (wt%) AZO Particle Size: 20-40nm	\$600/1kg
<b>AZO 7028HZW</b>	Name: Aluminum-doped Zinc Oxide in Water AZO Content: 10 wt% AZO Purity: $\geq 99.9\%$ (metal basis) AZO composition: ZnO: Al <sub>2</sub> O <sub>3</sub> = 98:2 (wt%) AZO Particle Size: primary 20-40nm; secondary $\leq 100$ nm	\$210/1kg
<b>AZO 7029HZW</b>	Name: Aluminum-doped Zinc Oxide in Water AZO Content: 20wt% AZO Purity: $\geq 99.9\%$ (metal basis) AZO composition: ZnO: Al <sub>2</sub> O <sub>3</sub> = 98:2 (wt%) AZO Particle Size: primary 20-40nm; secondary 200nm	\$360/1kg
<b>AZO 7027HZO</b>	Name: Aluminum-doped Zinc Oxide in dimethylbenzene AZO Content: 10 wt% AZO Purity: $\geq 99.9\%$ (metal basis) AZO composition: ZnO: Al <sub>2</sub> O <sub>3</sub> = 98:2 (wt%) AZO Particle Size: primary 20-40nm; secondary $\leq 100$ nm	\$260/1L
<b>C 8002HS</b>	1 wt% Multi-walled carbon nanotubes (MWNTs) in water Purity: 95% Diameter: 20-40 nm Length: 10 -20 $\mu$ m SSA: $> 360$ m <sup>2</sup> /g Color: black	\$120/500ml
<b>8004YJ</b>	1 wt% Multi-walled Carbon Nanotubes (MWNTs) in water Purity: $>95\%$ Diameter: 30-50nm Length: 10-20 $\mu$ m	\$200/kg
<b>8005YJ</b>	3 wt% MWCNT ( $>95\%$ , D 20-30nm, L 10-30 $\mu$ m) in Water	\$195/500 mL
<b>C 8009RB</b>	Product Name: Single-Walled Carbon Nanotubes (3 wt%) / Water Dispersion  Nanotubes Specifications: Purity: $> 95$ vol% (carbon nanotubes) $> 90$ vol% (single-walled nanotubes) Diameter: 1-2 nm Length: 5-30 $\mu$ m SSA: $\sim 400$ m <sup>2</sup> /g Color: black	\$90/10 ml \$175/25 ml \$295/50 ml \$535/100 ml \$1,890/500 ml

<b>C</b> <b>8033RB</b>	Product Name: Single-Walled Carbon Nanotubes (3 wt%) / N-Methyl-2-Pyrrolidinone Dispersion  Nanotubes Specifications: Purity: > 95 vol% (carbon nanotubes) > 90 vol% (single-walled nanotubes) Diameter: 1-2 nm Length: 5-30 um SSA: ~ 400 m <sup>2</sup> /g Color: black	\$95/10 ml \$180/25 ml \$300/50 ml \$540/100 ml \$1,950/500 ml \$3,750/1,000 ml
<b>C</b> <b>8037RB</b>	Product Name: Multi-Walled Carbon Nanotubes (3 wt%) / N-Methyl-2-Pyrrolidinone Dispersion  Nanotubes Specifications: Purity: > 90 wt% (ash < 7%, amorphous carbon < 3%) Diameter: 10-40 nm Length: 5-30 um Color: black	\$99/100 ml \$230/500 ml \$420/1,000 ml
<b>C</b> <b>8039RB</b>	Product Name: Multi-Walled Carbon Nanotubes (3 wt%) / N-Methyl-2-Pyrrolidinone Dispersion  Nanotubes Specifications: Purity: 90 wt% Diameter: 10-40 nm Length: 100 um Color: black	\$99/100 ml \$230/500 ml \$420/1,000 ml
<b>C</b> <b>8023NJ</b>	Product Name: Dispersible SWCNT (D 1-2 nm, L 5-30 um)  Components: 40-50 wt% SWCNT (Diameter 1-2 nm, Length 5-30 um) > 48-58 wt% polymers < 2.0 wt% impurities: < 0.04 wt% Al < 0.21 wt% Cl < 1.50 wt% Co < 0.15 wt% S  Max. dispersibility: 170 – 213 mg/ml water 140 – 175 mg/ml ethanol 150 – 188 mg/ml DMF 155 – 194 mg/ml NMP  Instructions for making dispersions: Ultrasound (< 150 Watts) - treating the "dispersible carbon nanotubes"/solvent mixture for 5 to 20 minutes.  Stability of as-synthesized dispersion: 1-10 days, decreasing with the CNT concentration in solvents.	\$450/g \$1,450/5g \$4,990/25g \$14,990/100g
<b>C</b> <b>8020NJ</b>	Product Name: Dispersible MWCNT (D 8-15 nm, L 10-50 um)  Components: 50-60 wt% MWCNT (Diameter 8-15 nm, Length 10-50 um) > 33-43 wt% polymers < 3.5 wt% metals (Fe, Ni, La, Al, Si) < 0.5 wt% non-metals (Cl, S) < 3.0 wt% amorphous carbon	\$123/g \$373/5g \$1,679/25g \$5,222/100g

	<p>Max. dispersibility:  79 – 106 mg/ml water  65 – 87 mg/ml ethanol  70 – 93 mg/ml DMF  72 – 96 mg/ml NMP</p> <p>Instructions for making dispersions:  Ultrasound (&lt; 150 Watts) - treating the "dispersible carbon nanotubes"/solvent mixture for 5 to 20 minutes.</p> <p>Stability of as-synthesized dispersion:  1-10 days, decreasing with the CNT concentration in solvents.</p>	
<b>C</b> <b>8021NJ</b>	<p>Product Name: Dispersible MWCNT (D 20-40 nm, L 5-30 um)</p> <p>Components:  50-70 wt% MWCNT (Diameter 20-40 nm, Length 5-30 um)  &gt; 23-43 wt% polymers  &lt; 3.5 wt% metals (Fe, Ni, La, Al, Si)  &lt; 0.5 wt% non-metals (Cl, S)  &lt; 3.0 wt% amorphous carbon</p> <p>Max. dispersibility:  68 – 98 mg/ml water  56 – 87 mg/ml ethanol  60 – 93 mg/ml DMF  62 – 96 mg/ml NMP</p> <p>Instructions for making dispersions:  Ultrasound (&lt; 150 Watts) - treating the "dispersible carbon nanotubes"/solvent mixture for 5 to 20 minutes.</p> <p>Stability of as-synthesized dispersion:  1-10 days, decreasing with the CNT concentration in solvents.</p>	<p>\$120/g  \$360/5g  \$1,620/25g  \$5,040/100g</p>
<b>C</b> <b>8022NJ</b>	<p>Product Name: Dispersible MWCNT (D 50-100 nm, L 5-10 um)</p> <p>Components:  65-70 wt% MWCNT (Diameter 50-100 nm, Length 5-10 um)  &gt; 23-28 wt% polymers  &lt; 3.5 wt% metals (Fe, Ni, La, Al, Si)  &lt; 0.5 wt% non-metals (Cl, S)  &lt; 3.0 wt% amorphous carbon</p> <p>Max. dispersibility:  68 – 79 mg/ml water  56 – 65 mg/ml ethanol  60 – 70 mg/ml DMF  62 – 72 mg/ml NMP</p> <p>Instructions for making dispersions:  Ultrasound (&lt; 150 Watts) - treating the "dispersible carbon nanotubes"/solvent mixture for 5 to 20 minutes.</p> <p>Stability of as-synthesized dispersion:  1-10 days, decreasing with the CNT concentration in solvents.</p>	<p>\$118/g  \$357/5g  \$1,607/25g  \$4,998/100g</p>

<b>ITO 7026HZW</b>	Indium Tin Oxide (ITO) in Water ITO Content: 0 - 30wt% variable ITO Purity: $\geq 99.99\%$ (metal basis) ITO composition: In <sub>2</sub> O <sub>3</sub> : SnO <sub>2</sub> = 90:10 (wt%) ITO Particle Size: primary APS $\leq 20$ nm; secondary $\leq 60$ nm Appearance: blue liquid	Quote
<b>ITO 7026HZO</b>	Indium Tin Oxide (ITO) in Organic Solvents ITO Content: 0 - 30wt% variable ITO Purity: $\geq 99.99\%$ (metal basis) ITO composition: In <sub>2</sub> O <sub>3</sub> : SnO <sub>2</sub> = 90:10 (wt%) ITO Particle Size: primary APS $\leq 20$ nm; secondary $\leq 60$ nm Appearance: blue liquid	Quote
<b>Pt (polymer coated) 7020HZ</b>	Platinum nanopowder (polymer coated), 99.95% Dispersibility: dispersible in water and organic solvents Composition: 10% platinum + 90% polymer Particle size: $\leq 15$ nm Color: black	\$7000/100g \$43384/kg
<b>SiO<sub>2</sub> 7015WJ</b>	Name: 25wt% Silicon Oxide in Water APS: 30 nm Ultraviolet reflection: 85% Viscosity(cp): 50-100 Silicon Oxide: SiO <sub>2</sub> , CAS #: 7631-86-9 Water : H <sub>2</sub> O, CAS#: 7732-18-5	\$128/1kg \$1080/10kg
<b>SiO<sub>2</sub> 7014WJQB</b>	Silicon Oxide Dispersion (30 wt%, 12-30 nm) in 1, 2-Propanediol APS: 12-30 nm Ultraviolet reflection: $>90\%$ Appearance: transparent liquid Silicon Oxide: SiO <sub>2</sub> , CAS #: 7631-86-9 1, 2-Propanediol, C <sub>3</sub> H <sub>8</sub> O <sub>2</sub> , CAS#: 57-55-6	Quote
<b>TiO<sub>2</sub> 7011WJWA</b>	Name: 15 wt% Titanium Oxide in Water APS: 15 nm Titanium Oxide: Anatase TiO <sub>2</sub> , CAS #: 1317-70-0 Water : H <sub>2</sub> O, CAS#: 7732-18-5	\$185/1kg \$1378/10kg
<b>TiO<sub>2</sub> 7012WJWR</b>	Name: 15 wt% Titanium Oxide in water APS: 5-30 nm Titanium Oxide: TiO <sub>2</sub> , Rutile, CAS #: 1317-80-2 Water: H <sub>2</sub> O, CAS#: 7732-18-5	\$118/1kg \$982/10kg
<b>TiO<sub>2</sub> 7012WJWA</b>	Name: 15 wt% Titanium Oxide in water APS: 5-30 nm Titanium Oxide: Anatase TiO <sub>2</sub> , CAS #: 1317-70-0 Water: H <sub>2</sub> O, CAS#: 7732-18-5	\$128/1kg
<b>TiO<sub>2</sub> 7013WJWR</b>	Titanium Oxide Dispersion (Rutile, 40 wt%, 30-50 nm) in Water APS: 30-50 nm pH: 6-8 Appearance: opaque, white liquid Titanium Oxide: Rutile TiO <sub>2</sub> , CAS #: 1317-80-2 Water: H <sub>2</sub> O, CAS#: 7732-18-5	\$156/1kg \$1450/10kg
<b>ZnO 7006WJ</b>	Name: 20 wt% Zinc Oxide in water Nano sized ZnO wt%: 20wt% (pale yellow powder) ZnO purity: $>99\%$ ZnO APS: 40 nm ZnO SSA: 50~70 m <sup>2</sup> /g Viscosity(cp): 60 ZnO Bulk Density: 0.30-0.45 g/cm <sup>3</sup> Appearance: Pale yellow Water: H <sub>2</sub> O, CAS#: 7732-18-5	\$240/L \$958/5 L Quote/100kg+

	Zinc Oxide: ZnO, CAS #: 1314-13-2	
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\*Hazardous products