

(II) Applications of Major Substances by Shapes (No.1)

Shape Substance	Single Crystal	Sintered or Amorphous	Powder	Porous or Through-Hole	Thin Film	Fiber	Composite or Bonded
Aluminum Oxide Al <sub>2</sub> O <sub>3</sub>	•Jewelry (ruby, sapphire) •Record needle •Bearing	•IC board •Luminescent material (tube for Na lamp) •Cutting tool •Heat/corrosion resistant vessel •Refractory	•Abrasives •Grinding material	•Adsorbent •Catalyst carrier •Honeycomb carrier	•Ceramic coating •Insulated substrate for IC	•Thermal resistant material •Reinforcing material for cermet	•Cermet (metal matrix)
Zinc Oxide ZnO	-	•Resistor	•White pigment •Electro-conductive paint	•Gas sensor	•Surface elasticity wave delay device	-	•Improver for sensitivity and selectivity of gas sensor (carried with Pt, Pd) •Varistor (composite with Bi <sub>2</sub> O <sub>3</sub> )
Titanium Oxide TiO <sub>2</sub>	•Jewelry (rutile) •Bearing	•Corrosion resistant vessel •Resistor	•White pigment	•Catalyst carrier •Gas sensor	•Coating for heat ray reflecting glass	•Thermal resistant insulation material	-
Tin Oxide SnO <sub>2</sub>	-	•Resistor	•Electro-conductive glaze	•Gas sensor	•Coating for heat ray reflecting glass	-	•Contact material (composite with Ag)
Barium Titanate BaTiO <sub>3</sub> and Titanate Zirconate	-	•Capacitor •Piezoelectric material •Pyroelectric material	-	•Secondary electron multiplier	•Capacitor •Surface elasticity wave delay device	-	•PTC thermistor (grain boundary is insulating) •Two-step PTC thermistor (Bi <sub>2</sub> O <sub>3</sub> layer is formed on PTC thermistor surface) •Flexible piezo-electric material (composite with PVF)