

AMCT22 ADVANCED STRUCTURAL CERAMIC MATERIALS

UNIT-1 OXIDE CERAMICS

- 1.1 Structural characteristics,
- 1.2 Properties and applications of silica, alumina,
- 1.3 Zirconia, magnesia, titania, thoria, mullite,
- 1.4 Uranium oxide and plutonium oxide.

UNIT-2 CARBIDES

- 2.1 Structural characteristics,
- 2.2 Properties and applications of silicon carbide,
- 2.3 Boron carbide, tungsten carbide, titanium carbide.

UNIT-3 NITRIDES

- 3.1 Structural characteristics,
- 3.2 Properties and applications of silicon nitride,
- 3.3 Boron nitride, titanium nitride, aluminum nitride.

UNIT-4 ADVANCED CERAMICS

- 4.1 Carbon compounds,
- 4.2 Borides, silicides, Sialon and cermets,
- 4.3 High temperature superconducting oxides.

UNIT-5 SINGLE CRYSTALS

- 5.1 Introduction, techniques for forming- Kyropolar technique.
- 5.2 Czochralski method,
- 5.3 Edge defined-film fed growth method,
- 5.4 Bridgman technique, floating zone method, flux technique,
- 5.5 Hydro-thermal growth technique,
- 5.6 Micro pulling down technique.

References Books:

1. Brook R.J (ed), Concise Encyclopedia of Advanced Ceramic Materials, Pergamon Press, 1991.
2. Noboru Ichinose, Introduction to Fine Ceramics, John Wiley and Sons, 1987.
3. Gernot Kostorz, High Tech Ceramics, Academic Press, NY, 1989.