

# AMCT24 CALCULATIONS IN CERAMICS

## UNIT-1 ULTIMATE & RATIONAL ANALYSIS

- 1.1 Ultimate analysis, proximate analysis,
- 1.2 Rational analysis of clay, stone and feldspar
- 1.3 Mica convention- substitution of clays in body recipes- triangular plot.

## UNIT-2 DETERMINATION OF PHYSICAL PROPERTIES

- 2.1 Shrinkage- Drying, Firing, Total, Volume, Moisture content
- 2.2 Relationship between percentage moisture content and volume shrinkage
- 2.3 Loss on ignition- density
- 2.4 Specific gravity- effect of porosity on the function of ceramic materials-
- 2.5 Pore structure density-
- 2.6 Apparent volume- true volume
- 2.7 Apparent solid volume, porosity- apparent, true, sealed pores.

## UNIT-3 CALCULATIONS OF BODY & SUSPENSIONS

- 3.1 Density of a slip
- 3.2 Calculations relating to mixtures of solid particles and water
- 3.3 Dilution problems
- 3.4 Brongniarts Formula- dry measurement,
- 3.5 Wet measurement- effect of specific gravity, Density of the body slip
- 3.6 Dimensions of the mixing ark-adjustments to the wet recipe
- 3.7 Addition of body stain.

## UNIT-4 GLAZE CALCULATIONS

- 4.1 Molecular weights- formula and use of chemical equations- oxides
- 4.2 Percentage composition and formula
- 4.3 Calculation of a recipe from a simple glaze formula- given the recipe of a glaze
- 4.4 Calculate the formula- synthesis of a fritted glaze- given the recipe calculate the formula for a fritted glaze-calculation of the percentage composition of the mill batch.

## UNIT-5 GLASS CALCULATIONS

- 5.1 Determination of molecular formula of glass from chemical composition of the glass and from glass batch
- 5.2 Determination of batch from molecular formula of glass
- 5.3 Determination of batch from the given chemical composition.

## References Books:

1. Hiraoki Yanagida, The Chemistry of Ceramics, John Wiley and Sons, 1996.
2. Terpstra, Ceramic Processing, Chapman and Hall, 1995.
3. Tooley F.V, Handbook of Glass Manufacture, Vol I&II, Ogden Publishing Co., NY, 1960.