

# Separation Science & Thermal Analysis Section (SS & TAS), ACD

## Surface area Analyser

Surface area is one of the important parameters for characterising the catalytic activity and reactivity of powders and compacts, adsorbents ceramics, resins, pharmaceuticals, paints etc.

**Principle:** Dynamic, single point BET method based on physical adsorption of nitrogen in a specimen from a mixture of helium and nitrogen to liquid nitrogen temperature is employed. Adsorption and desorption signals record the changes in nitrogen concentration of the flowing gas stream using a thermal conductivity detector. The integrated desorption signal is proportional to the volume of the nitrogen adsorbed, from which the surface area is arrived at using BET equation, viz,

$$\frac{V \left[ \frac{C - P_0}{P_0} - 1 \right]}{P} = \frac{V_m C}{V_m C} + \frac{V_m C}{V_m C P_0}$$

- V = Volume of adsorbate adsorbed
- V<sub>m</sub> = Volume of adsorbate adsorbed for a complete monolayer.
- P = Adsorbate equilibrium vapour pressure
- P<sub>0</sub> = Adsorbate saturated vapour pressure
- C = BET constant

**Samples Analysed :** Molecular sieves, activated carbon, catalysts, etc.



Instrument : Home-built Surface area Analyser  
 Range : 0.5 – 1500 m<sup>2</sup>/g  
 Sample size : 10 mg-2 g.  
 Measurement time : About 15 minutes on outgassed sample.

