

# IGC SURFACE ENERGY ANALYZER

## RAMCON IGC SEA

The iGC-SEA is based on Inverse Gas Chromatography (IGC) methodology and is a gas phase technique for characterising surface and bulk properties of solid materials. A cylindrical column is uniformly packed with the solid material of interest, typically a powder, fibre or film. A pulse of constant concentration of gas is then injected down the column at a fixed carrier gas flow rate, and the time taken for the pulse or concentration front to elute down the column is measured by a detector. A series of IGC measurements with different gas phase probe molecules then allows access to a wide range of physico-chemical properties of the solid sample, e.g. the dispersive component of the surface energy ( $\gamma^d_s$ ) can be calculated from the retention times obtained from inverse gas chromatography measurements of a series of n-alkane probes injected at infinite dilution (concentration within the Henry region of the adsorption isotherm).

## ACQUIRED INFORMATION

- > Surface energy and its components profile
- > Dispersive surface energy distribution
- > Free energy profiles
- > Surface energy and adhesion of powders and fibers
- > Porosity and surface area
- > Diffusion and permeability
- > Drying and dehydration
- > Polymers – solvent swelling and interactions
- > Hildebrand's solubility parameter
- > Work of adhesion of water and work of cohesion
- > Vapor pressure of solids and liquids

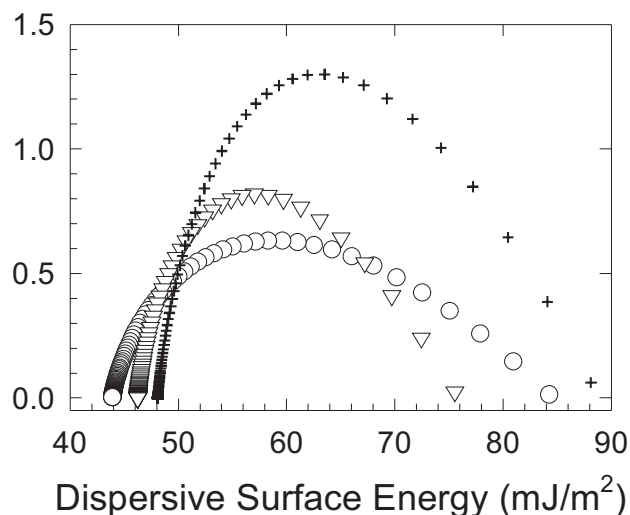


## SAMPLE TYPES

- > Powder, fibers, films, nanoparticles, granules and semi-solids
- > Pharmaceuticals, food, cements and building materials, microelectronics, polymers and packaging, membranes, personal care products and composites
- > Tobacco, bio and natural materials

## MODES, CONDITIONS AND PRECISION

- > Sample size 1 mg to  $\approx$  10 g
- > Temperature operating range from 30 °C to 130 °C
- > Very good reproducibility and repeatability (RSD%=1)
- > Column design: Straight silanized glass tube (length 300 mm, diameter 3-5 mm)
- > FID detector
- > Analysis software: Peak analysis and provides physicochemical data for the solid sample



A typical dispersive surface energy distributions of studied powders.

DETAILED INFORMATION ON REQUEST



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