ethyl benzene, isopropyl benzene, m-xylene, p-xylene, and 1,3,5-trimethyl benzene were determined for a hydrated surface of a large-pored silica gel. The apparatus used was an adsorption calorimeter equipped with a heat exchanger to maintain a constant temperature of 20°. Evaluation of the area occupied by the molecules of each of these hydrocarbons in the dense monolayer was made on the basis of their Van der Waal's values and the possible packing configuration. For the hydrocarbons with the same number of carbon atoms per molecule, the heats of adsorption of alicyclics on the hydrated surface of silica gel differ very little from those of the normal hydrocarbons but are appreciably smaller than of the aromatics. Compared to the corresponding heats of adsorption on a graphitic carbon black, the heats of adsorption on a hydrated surface of silica gel are smaller with normal alkanes and larger with aromatics. The higher heat values in the latter case are due to the additional effect (in addition to the electrokinetic, dispersional, interaction) of interaction of, principally, the pi-electron bonds of the aromatic ring with the hydroxyl groups of the silica gel. Consequently, the mobility of adsorbed aromatic molecules is appreciably smaller on the hydrated surface of silica than on the surface of the carbon black.

A Dynamic Method for Determination of Specific Surfaces of Adsorbents by Continuous Adsorption from a Solution Stream

By V. T. Bikov and O. E. Pryesnyakova
The Far-Eastern Affiliate of Siberian Division of the Academy of Sciences of U.S.S.R.

The dynamic method proposed earlier, to determine surface areas and structure of adsorbents in continuous contact with a solution stream, is also applicable to the study of adsorbents with wide pore size ranges. A comparison is presented between the settling area values of phenol molecules as determined by adsorption of phenol (from its solution in carbon tetrachloride) on the standard silica gels with those calculated from the possible configurations of variously oriented molecules with van der Waals' dimensional properties. Based on the comparative settling area values, a hypothesis is proposed regarding the orientation effect of the hydroxyl group upon the molecules of phenol on the adsorbing surface.

Application of Infrared Spectroscopy to Study of Natural Sorbents

By V. T. Bikov and V. N. Soosheen
The Far-Eastern Affiliate of Siberian Division of the Academy of Sciences of U.S.S.R.

The infrared spectra in the range of 400 to 5,000 cm^{-1} were obtained for several natural sorbents as well as for silica gel, montmorillonite and kaolinite. An attempt is made to explain the characteristic bands present in the infrared spectra of natural sorbents. The possibility to use infrared spectroscopy is noted in studying the adsorption mechanism of natural sorbents as well as of the structural peculiarities of complex polymineral compounds, such as the natural sorbents.

Glass Cell With Conductive Walls for Determination of Contact Potential Differences

By V. A. Lyando, Yu. A. Alaboojev, I. S. Sazonova, and L. A. Sazonov
The Institute of Catalysis of Siberian Division of the Academy of Sciences of U.S.S.R.

A simply and easily constructed glass cell with a conductive surface covering is proposed for measuring the electronic work function at temperatures of 20° to 600°. The reference electrode can be preheated to a temperature up to 450° and the samples, which can be measured in either an oxidizing or a reducing atmosphere, can be heated to a temperature up to 900°. The reproducibility of the work function values obtained is within 0.01 volt.