QUANTITATIVE DETERMINATION OF SURFACE AREA OF SILICA GEL PARTICLES BY NEAR INFRARED SPECTROSCOPY AND CHEMOMETRICS

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Surface area of silicagel particles has been determined by partial least squares calibration of the near infrared profiles of silica gel particles against BET (Brunauer, Emmet and Teller method) surface area. Two sets of silica samples were prepared in the range 300-600 m^2/g and 200-750 m^2/g from altogether six silica gel samples with quantitatively determined BET surface areas. The two sets contained 35 and 30 mixtures respectively. They were prepared by mixing different quantities of the silica gel samples so that the resulting mixtures gave gradual increase in surface areas. The Near infrared spectra of the mixtures were then measured in the region 4000-11000 cm^{-1} and the second derivated spectral profiles were calibrated against the respective calculated surface areas of the mixtures. The calibration model was then used to predict the surface area of unknown silica gel samples. The model established with the first set predicted the surface area within an error limit of $\pm 5\%$. The model established with second set of samples predicted the surface area with an error limit of $\pm 8\%$.