ANALYSIS OF THE ADSORPTION EVOLUTION OF METHANOL MOLECULES ON SILICA GEL SURFACE BY NEAR INFRARED SPECTROMETRY AND CHEMOMETRICS-AN ALTERNATIVE METHOD FOR THE DETERMINATION OF SILANOL NUMBER?

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The adsorption properties of silica gel particles depend on the surface silanol groups and these groups are exploited for chemical modification in several different fields including catalysis, separation science and polymers. Silanol number is the number of OH groups present per nm^2. Wet chemical methods have been used in the silanol number determination. These methods are tedious and time consuming.

In this paper a revolutionary way of studying the adsorption of methanol molecules on silica gel surface by following near infrared profiles of the silica gel during the adsorption process and the weight gained over a certain period of time is reported. This data would provide evolutionary profiles of adsorption and these profiles can be treated by chemometrics to identify the type of methanol molecule adsorption on the surface. The weight difference would give the number of methanol molecules on the surface and the weight difference at an appropriate time during the evolution would give mono layer methanol molecular adsorption on the surface. Once the weight of the mono layer methanol moleculesh is determined, the silanol number can be determined.