Smectite Interactions with Riboflavin

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Abstract: Smectite with polyvalent cations on the exchange complex readily absorbed riboflavin from aqueous solution to a limit of about 0.5 mmole/g. The shape of the adsorption isotherms was of the Langmuir type. An exception was Na^{+}-smectite which provided an S-shaped isotherm and smaller amounts of adsorption. Ca^{2+}-vermiculite had no interlamellar adsorption of riboflavin, suggesting that this mineral does not swell sufficiently to permit such adsorption. Adsorption isotherms, X-ray powder diffraction data, and UV-visible spectroscopic data suggest that the mechanisms of interaction between smectite and riboflavin may involve a combination of ion-dipole, charge transfer, hydrogen bonding, and physical effects.

Key Words: Adsorption • Charge-transfer complex • Riboflavin • Smectite • UV-visible spectra • Vermiculite

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