

and 50 for cesium. These decontamination factors are consistent with those observed in practice.

Conclusion

The model was based on equilibrium constants for the ion-exchange reactions written in terms of liquid- and solid-phase activities. Liquid-phase activity coefficients were calculated from the Pitzer equation for cations. Solid-phase activity coefficients were calculated from the Wilson equation. Agreement between experimental and predicted concentrations for the five-component data was better than for some of the ternary- and four-component data. Agreement was best for cesium ($R/N=0.064$) and strontium ($R/N=0.17$) and worst for calcium ($R/N=0.71$). Cesium and strontium concentrations were measured by Robinson et al. using radioactive tracers, and detection limits for these species were more precise by approximately an order of magnitude than for calcium, mag-

nesium, and sodium. This factor probably accounts for the lower average deviations for the cesium and strontium data.

Literature Cited

- Myers, A. L., and S. Byington, "Thermodynamics of Ion Exchange: Prediction of Multicomponent Equilibria from Binary Data," *Ion Exchange: Science and Technology*, A. E. Rodrigues, ed., NATO ASI Series E 107, p. 119 (1986).
- Pitzer, K. S., and J. J. Kim, "Thermodynamics of Electrolytes: IV. Activity and Osmotic Coefficients for Mixed Electrolytes," *J. Amer. Chem. Soc.*, **96**(18), 5701 (1974).
- Robinson, S. M., W. D. Arnold, and C. H. Byers, "Multicomponent Ion Exchange Equilibria in Chabazite Zeolite," *ACS Symp. Ser.*, No. 486, *Emerging Technologies in Hazardous Waste Treatment II*, D. W. Tedder and F. G. Pohland, eds. (1991).
- Shallcross, D. C., C. C. Herrmann, and B. J. McCoy, "An Improved Model for the Prediction of Multicomponent Ion Exchange Equilibria," *Chem. Eng. Sci.*, **43**(2), 279 (1988).
- Smith, R. P., and E. T. Woodburn, "Prediction of Multicomponent Ion Exchange Equilibria for the Ternary System SO_4^{2-} - NO_3^- -Cl from Data of Binary Systems," *AIChE J.*, **24**(4), 577 (1978).

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Errata

In the article titled "Simulation of Carbon Gasification Kinetics Using an Edge Recession Model" by Kyotani et al. (July 1993, p. 1178), the following corrections are made.

- Equation 4 (p. 1181) should read as follows:

$$\text{RSA} = \frac{\text{number of zig-zag + armchair + type D sites}}{\text{number of remaining C atoms at given } X} \quad (4)$$

- On p. 1181, first full paragraph, the second sentence should read as follows: "The values listed correspond to reaction probabilities relative to that of singly bonded edge atoms, which is taken to be unity."
- On p. 1184, second column, the reference to the work of Leon y Leon should read: "Leon y Leon, 1993."