the reaction as postulated, the equilibrium constant is calculated from the standard free energy change for the postulated reaction. The thermodynamic activities of the other reactants and products must be assumed or obtained from independent measurement or independent theory.

The magnitude of the Gibbs free energy change for reactants in their standard states converting to products in their standard states at a given temperature is the basic data source for determining the quantitative value of the relationship between reactants and products for what can be an infinite number of activity and concentration sets that are stable and will not change at that temperature. The claim that its use is valid only for materials in their standard states is as misleading and as incorrect as is the claim that canaries were used in coal mines only as a source of music.

By itself, the sign and numerical value of the standard free energy for reactants and products in their standard states is a direct and classic indicator for estimating relative differences in the equilibrium activities of the numerator and denominator of the equilibrium constant. If desired, it can be used to calculate the quantitative value of the equilibrium constant. It is not restricted to situations where the reactants and products must be in their standard states.

I do not believe that this approach is a misconception on my part. What I do believe is that the claim by Arthur and Apted that "this approach, therefore, cannot provide a basis for determining reaction potential in systems (for example, those existing in a repository) that are not at standard-state conditions" is naive and erroneous.

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COMMENTS ON "AMERICIUM FILTRATION IN GLAUCONITIC SAND COLUMNS"

The recent paper by Saltelli et al.[1] presents the migration characteristics of polydispersed ^{241}Am colloid in sand columns. In this paper, the nature of the colloid migration was explained as convection, filtration, and sorption of the polydispersed colloid in solution. The sorption saturation mechanism was interpreted with a Langmuir isotherm.

The most interesting observation in this work is that the plateau of americium concentration in the column was generated rapidly (within 28 days) and did not seem to increase with time. This phenomenon was explained as not due to the colloid filtration, but due to the adsorption of the colloid on the packing material under a Langmuir-type isotherm. Considering this observation, polydispersed colloid migration in the porous media was modeled and it showed a good agreement with experimental results. However, if we look into this model, it shows an inconsistency with the observation: Even though it was explained that the plateau was not thought to be affected by colloid filtration, Eq. (17) included the filtration term. Thus, in Figs. 8, 9, and 10, the americium plateaus from modeling increase with time.

In summary, the modeling through observation does not seem to be proper.

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RESPONSE TO "COMMENTS ON 'AMERICIUM FILTRATION IN GLAUCONITIC SAND COLUMNS'"

I have read Dr. Choi's letter and am puzzled by his concluding remark.

Of course my Eq. (17) includes a filtration term; the point we are making in the paper is that the filtration term is not responsible for the plateau at early times, which—I believe—we have shown.

Is the apparent plateau in Figs. 8, 9, and 10 increasing? This does not seem to be the case at all. What is increasing is the overall colloid concentration in the column, which is superimposed on the plateau; in Fig. 10 the plateau is no longer visible.

We encourage Dr. Choi to verify the above by testing the model without the sorption term, in order to verify the influence of filtration alone.

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