

Highlights

Behavior of weakly adsorbing protein impurities in flow-through ion-exchange chromatography

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- Contributions to the breakthrough of weakly adsorbing impurities are elucidated.
- Column simulations show that dilute impurity breakthrough can be rather diffuse.
- Dilute solute breakthrough volumes correlate with a mass transfer Graetz number.
- Stoichiometric displacement model parameters follow a separate correlation.