
Effect of KCl and CaCl₂ as Background Electrolytes on the Competitive Adsorption of Glyphosate and Phosphate on Goethite

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Abstract: Competitive adsorption between glyphosate and phosphate on goethite was evaluated. The influence of background electrolyte on the adsorption of glyphosate and phosphate was also investigated by using 0.01 M KCl, 0.1 M KCl and 0.01 M CaCl₂ as background electrolytes. Experiments showed that phosphate displaced adsorbed glyphosate from goethite, whereas glyphosate did not displace phosphate. Results also showed that the background electrolyte had a strong effect on phosphate adsorption, but little effect on glyphosate adsorption. Thus, there are differences between the adsorption of glyphosate and phosphate. The study also showed that 0.01 M KCl caused dispersion of goethite, resulting in inefficient filtering, and that phosphate precipitated as calcium phosphates in 0.01 M CaCl₂ background electrolyte solutions. The results suggest that 0.1 M KCl is a more suitable background electrolyte to determine competitive adsorption processes involving glyphosate and phosphate.

Key Words: Adsorption • Background Electrolyte • Competition • Glyphosate • Goethite • Phosphate

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