



## Statistical study of factors affecting the phase separation kinetics in solvent extraction for uranium recovery from phosphoric acid

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### ABSTRACT

The phase separation kinetics for the process of recovering uranium from phosphoric acid medium (WPA) with 1.5 M D2EHPA + 0.2 M TBP is influenced by process variables such as D2EHPA/TBP concentration in the organic phase, acid concentration of the aqueous phase, temperature, phase ratio (A/O). To correlate the effect of these variables on phase separation kinetics (phase separation time, specific settling rate (SSR) for aqueous and organic), a statistical approach of data generation and analysis using factorial design of experimentation (DOE) has been adopted. The significance of individual variables and their mutual interactions on phase separation behaviour in WPA-D2EHPA + TBP process was statistically derived using the DOE data. Mathematical models representing a relation between the responses (phase separation time, SSR organic or SSR aqueous) and variables were established. The percentage effects of each variable on response were calculated from these models. Further a real variable mathematical equation is proposed, to predict the phase separation time in WPA-D2EHPA+TBP system for the given value of variable within the experimental range.

*Keywords:* Phase separation; Factorial design; D2EHPA-TBP; WPA; MGA; Kinetics; Phosphoric acid; Uranium

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