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Inhibition the formation of cruds in extraction systems

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In radiochemistry, liquid extraction is widely used to concentration and separation of elements. Often, upon contact of two immiscible liquids, interfacial formations (cruds) are formed in the area of the interface, which reduce the rate of extraction, worsen the separation of the emulsion, and complicate the process. Sometimes a precipitate is formed that disrupts the operation of the extractors, reduces their productivity and the duration of uninterrupted operation. The high heat release from radioactive precipitation causes local overheating and may be accompanied by emissions. The search for ways to inhibition the formation of cruds is actual.
This report presents the results of investigation on the effect of mechanical vibrations on the formation of interfacial formations during the extraction of rare earth elements with solutions of di-(2-ethylhexyl)phosphoric acid. Local energy supply to the interface of the heterogeneous system was carried out using a vibration element placed in the interfacial layer and driven by an electrodynamic head.
Vibration are inhibition structure formation in the interface of the extraction system. Under the action of vibration, the emerging temporary structure is destroyed. In the presence of vibration, the effective viscosity in the interfacial layer does not change in the first 15 min, then it slightly increases. The supply of additional energy to the interfacial layer of the extraction system changes the hydrodynamic situation. Under the influence of mechanical vibrations, particles of different masses move at different speeds, which negatively affects the formation of the temporal structure. Molecules of di-(2-ethylhexyl)lanthanide phosphate are adsorbed on the active lyophobic areas of the surface of emerging particles, creating a structural-mechanical barrier that prevents inertial coagulation of particles, excluding the possibility of strong coagulation contacts, and hence strong high-viscosity dispersion structures.
Thus, the vibration in the interfacial layer, placed on the phase interface by a vibrating element, prevents the formation of structure and provides a higher aggregative stability of the system.
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