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Liquid-liquid extraction of technetium(VII) with TODGA

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N,N,N',N'-tetraoctyl-diglycolamide (TODGA) is broadly studied as a non-specific extractant for actinides and lanthanides from HNO₃ solutions of nuclear waste, in particular for group actinide extraction (GANEX process). Unfortunately, some fission products including technetium (in the form of pertechnetate anion, ⁹⁹TcO₄⁻) are also efficiently extracted from HNO₃ solutions to the TODGA-containing organic phase, accompanying the actinides and lanthanides.

The present work was focused on modelling the process of technetium extraction to organic solutions of TODGA. The TcO₄⁻ anion is evidently extracted to the organic phase as the ion pair, together with a lipophilic cation – the protonated TODGA molecule. We investigated the effects of acidity, of anions that compete with TcO₄⁻ for the lipophilic cation, and of diluent on the efficiency of extraction of technetium(VII). The effect of other metals present in the extraction system was also studied.

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