

## The outer-sphere association of p-sulfonatothiacalix[4]arene with some Co(III) complexes: The effect on their redox activity in aqueous solutions

Mustafina A., Shtyrlin V., Zakharova L., Skripacheva V., Zairov R., Solov'eva S., Antipin I., Konovalov A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

### Abstract

The effect of the ion-pairing of Co(III) complexes with p-sulfonatothiacalix[4]arene (STCA) on Fe(II)-Co(III) electron transfer rate was evaluated from the analysis and comparison of kinetic data in double Co(III)-Fe(II) and triple Co(III)-Fe(II)-STCA systems at various concentration conditions. Complexes [Co(en)<sub>3</sub>]<sup>3+</sup>(1), [Co(en) 2ox]<sup>+</sup>(2), [Co(dipy)<sub>3</sub>]<sup>3+</sup>(3), [Co(His)<sub>2</sub>]<sup>+</sup>(4) and [Fe(CN)<sub>6</sub>]<sup>4-</sup> were chosen as Co(III) and Fe(II) compounds. The effect of STCA was found to correlate with the association mode. The outer-sphere association with STCA was found to exhibit the insignificant effect on Fe(II)-Co(III) electron transfer  $k_{et}$  constants for complexes 3 and 4 with bulky and rigid chelate rings, while more sufficient inclusion of flexible ethylenediamine rings of 1 and 2 into the cavity of STCA results in the unusual increase of  $k_{et}$ . © 2007 Springer Science+Business Media, Inc.

<http://dx.doi.org/10.1007/s10847-007-9290-7>

---

### Keywords

Co(III) complex, Inclusion complex, Outer-sphere electron transfer, P-sulfonatothiacalix[4]arene