

N,N'-Bis(9-Phenyl-9-Thioxanthenyl)Ethylenediamine: Highly Selective Host Behaviour in the Presence of Xylene and Ethylbenzene Guest Mixtures

Lize De Jager*, Benita Barton, Mino R. Caira and Eric C. Hosten
Department of Chemistry, Mandela Metropolitan University, South Africa

Host compound *N,N'*-bis(9-phenyl-9-thioxanthenyl)ethylenediamine formed 1:1 host: guest complexes with *o*- and *p*- xylene and ethyl benzene, when recrystallized from them. The *meta*-isomer was not included. Competition experiments using equimolar binary and ternary mixtures of the three xylenes demonstrated that this host is markedly selective for *p*-xylene ($\geq 94\%$ on both a milligram and gram scale), while 68% of this guest was extracted from an equimolar quaternary mixture of the three xylenes and ethylbenzene. This selectivity was also evident when guest ratios in binary mixtures containing *p*-xylene were varied. The observed high affinity for the *para*-isomer was explained using SCXRD, Hirschfield surfaces and thermal experiments. Furthermore, the host was subjected to gas phase guests to establish whether the ability existed for complexation of these guests from the solid state.