# The Synthesis of, and Application in Chemical Separations of, 8-Hydroxyquinoline-5-azo-substituted Polystyrene

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THE application of chelating polymers to chemical separations has resulted in greater selectivity than exists with sulphonic acid exchangers.[1] Advances have been limited by the availability of useful chelating polymers; for example, the only commercially available resin is Dowex A-1, which has iminodiacetic acid as the chelating group.

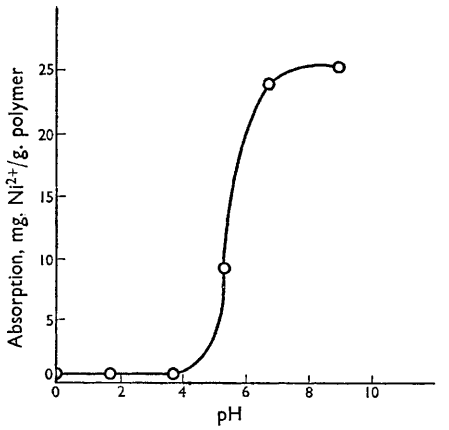


FIGURE. *pH Dependence of nickel absorption by 8-hydroxyquinoline-5-azo-substituted polystyrene.*

We believe that the lack of commercial chelating polymers, and the difficulty of reproducing polymer syntheses, can be circumvented by chemically bonding chelating-groups to the polymer backbone of commercial inert-polymers. By analogy with solvent-extraction techniques, one of the more widely applicable chelating polymers will contain quinolin-8-ol as the chelating moiety. We have now synthesized such a polymer.

A styrene matrix (*M* 230,000) was nitrated, reduced with $Na_2S_2$, diazotized, and coupled with quinolin-8-ol. Batch distribution studies were made between the chelate polymer and $10^{-2}$M-$Ni^{2+}$ in ammonium acetate buffers with use of dimethylglyoxime for nickel analysis. The observed capacity using 0·5 g. of chelate polymer was one milliequivalent per g. The Figure shows this chelation as a function of pH.

We are investigating applications to ions other than $Ni^{2+}$.

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[1] R. Rosset, *Bull. Soc. chim. France*, 1966, 59.
[2] L. Pennington and M. B. Williams, *Ind. Eng. Chem.*, 1959, **51**, 759.