Mixed complexes of cobalt(III) with phenanthroline and galactose or arabinose

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Mixed complexes of bis-phenanthroline cobalt(III) and ?-D-galactose or ?-D- or L-arabinose are identified in aqueous solution from their 1H NMR and circular dichroism (CD) spectra. Galactose forms only the ?-complex, but D-arabinose gives preferentially ?-, and L-arabinose preferentially ?-complexes, consistent with structural optimization with PM3 (tm) parameters. The ?-complex is formed initially from ?-D-arabinose, but the ?-complex is preferred thermodynamically. Examination of the absorption and CD spectra gives information on configuration at cobalt(III) and allows assignments of electronic transitions in Co(III) and the phenanthroline residues.