

# Metallic carbonyl complexes containing heterocyclic nitrogen ligands-I. Rhenium derivatives

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The preparation and spectroscopic properties of monometallic complexes of rhenium(I)tricarbonylbromide coordinated to 6,7-dihydrodipyrido-[2,3-b : 3',2'-j]-1,10-phenanthroline (2-4N), 7,8-dihydro-6H-cyclohepta-[2,1-b : 3,4-b]-di-1,8-naphthyridine (3-4N), 2,2'-bi-(3-methyl)-1,8-naphthyridine (Me<sub>2</sub>O-4N), 2,2'-bi-1,8-naphthyridine (O-4N) and 2,7-di(2'-pyridyl)-1,8-naphthyridine (bnpn) are described. The complexes show a low energy electronic absorption band which is solvent sensitive and has been assigned as a  $t_{2g} \rightarrow e_g^*$  rhenium-to-ligand charge-transfer band. The CO stretching frequencies were in accord with facial geometry for the complexes. The NMR properties agreed with the IR results, showing the equivalence of the two naphthyridine fragments in the complexes. Electrochemically all the complexes display two reductions and two oxidations in the potential region from + 2.0 to - 1.6 V. The reduction potential,  $E_{red}$ , for the ReI/Re<sup>0</sup> couple shows a good relationship with the lowest energy ab