A family of ruthenium complexes containing the non-innocent ligand o-benzoquinonediimine. An infrared structural interpretation

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It has been shown that innocent ligands always contribute with a similar electron density to a metal centre in a complex regardless of which other innocent ligands are bonded to the same centre, while non-innocent ligands are capable of tuning electron density on the metal centre depending on the nature of the other ligands. The present work reports the IR spectral characterisation of four ruthenium complexes containing the non-innocent ligand o-benzoquinonediimine and different innocent ligands (Ru(C6H 4{NH}2)(Cl)2(PPh3)2; [Ru(CH3CN)(C6H4{NH}2)(Cl)(PPh 3)2][BF4]; [Ru(CH3CN) 2(C6H4{NH}2)(PPh3) 2[BF4]2, and [Ru(C6H 4{NH}2)({C2H5}2NCS 2) (PPh3)2][Cl]. The C=N vibration correlates with the EL values of the ligands. We found that the o-benzoquinonediimine ligand modulates the vibrational energies depending on the nature of the innocent ligands bonded to the ruthenium atom.