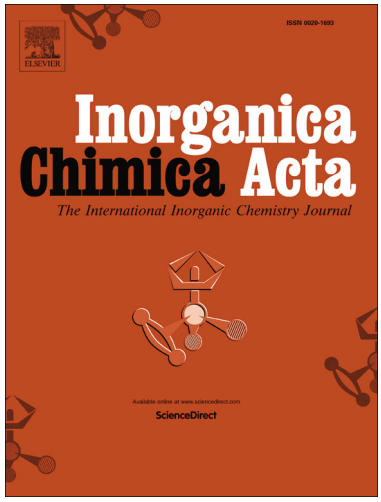

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Fe(III) SalEen derived Schiff base complexes as potential contrast agents

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Abstract Three iron(III) complexes with ligands derived from *N*-ethyl-*N*-(2-aminoethyl)salicylaldiminate (H, **1;** 5-Br, **2**; 3-OMe, **3** substituents at the phenyl group) were prepared and the X-ray crystal structures of **1** and **2** are reported. NMR studies of solutions of these complexes in DMSO allowed for investigation of their magnetic behaviour and paramagnetic relaxation contribution. The relaxivities measured ranged from 0.35 to 0.80 mM^{-1} s^{-1} for proton Larmor frequencies from 0.01 to 300 MHz, in agreement with those known for other iron(III) based contrast agents. Biological studies on colonic epithelial T_{84} cell monolayers showed that the compounds exert toxic effects only at concentrations higher than 100 μM while coincidently reducing colonic epithelial secretory function. These two features make these complexes good candidates for further development in order to be used as MRI contrast agents.

1. Introduction

Magnetic Resonance Imaging (MRI) is a widely used technique for visualising anatomical soft tissue, using non-ionizing radiation and displaying excellent spatial resolution [1]. However, it has a limited sensitivity when compared with other imaging techniques (e.g. optical or nuclear) [2,3], due to the abundance of the water signal monitored [4]. Thus, efforts to improve this shortcoming focus mainly on chemical substances which enhance MRI contrast [5].

The field of MRI contrast agents has been dominated by trivalent gadolinium (Gd^{3+}) complexes [5–8] as they are paramagnetic with seven unpaired electrons [5]. However,