Synthesis, characterization and antibacterial activity of some new ferrocenyl selenazoles and 3,5-diferrocenyl-1,2,4-selenadiazole

Abstract

New ferrocenyl containing selenazole derivatives were synthesized from reactions of aryl selenocarboxamide (i.e. Ar-C=Se(NH2); Ar=C6H5 (1), 4-Br-C6H4 (2), 4-PhC6H4 (3), 4-CH3OC6H4 (4), 4-CH3SC6H4 (5), 6-MeO-naphyl (6), 4-MeO-naphthyl (7), 4-C2H5OC6H4 (8), 3,4-(CH3O)(2)C6H3 (9), and 3,5-(CH3O)(2)C6H3 (10)) with (2-bromoacetyl) ferrocene. The structures of the new compounds were determined by elemental analyses, IR, H-1 and C-13 NMR and mass spectroscopic data. Reaction of 1-cyanoferrocene with sodium hydrogen selenide (NaHSe) in methanol gave the new ferrocenyl selenocarboxamide (11) in 27% yield. Treatment of compound 11 with a catalytic amount of Na-2[PdCl4] gave 3,5-diferrocenyl-1,2,4-selenadiazole in 35% yield. Both compounds were characterized elemental analyses and spectroscopic techniques. Compounds 1-10 and 12 were screened as antibacterial agents against Staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa and showed promising properties.