

Synthesis, characterization and cytotoxic activity of S-benzylthiocarbamate Schiff bases derived from 5-fluoroisatin, 5-chloroisatin, 5-bromoisatin and their crystal structures

ABSTRACT

Schiff bases were prepared from S-benzylthiocarbamate with 5-fluoro-, 5-chloro- and 5-bromoisatin. All are potential tridentate nitrogen, oxygen, sulfur donors. They were found to be selectively active against MCF-7 cell line (Human non-metastatic mammary gland adenocarcinoma cell line). The bromide and fluoride compounds were the most active with IC₅₀ values of 6.40 M (2.6 g/mL) and 9.26 M (3.2 g/mL) respectively while the chloride derivative was weakly active with an IC₅₀ value of 38.69 M (14.0 g/mL). The cytotoxic activity of the halo substituted isatins against the breast cancer cell lines tested is in the order of Br > F > Cl. Planarity of the isatin ring in the Schiff bases can be arranged in the following order SB5FISA > SB5CIISA > SB5BrISA while the perpendicularity of the benzyl ring towards the dithiocarbamate plane can be ordered as follows, SB5FISA > SB5BrISA > SB5CIISA.

Keyword: Dithiocarbamate; Schiff base; Isatin; MCF-7; Structure