World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Design and Development of Novel Anion Selective Chemosensors Derived from Vitamin B6 Cofactors

Authors : Darshna Sharma, Suban K. Sahoo

Abstract : The detection of intracellular fluoride in human cancer cell HeLa was achieved by chemosensors derived from vitamin B6 cofactors using fluorescence imaging technique. These sensors were first synthesized by condensation of pyridoxal/pyridoxal phosphate with 2-amino(thio)phenol. The anion recognition ability was explored by experimental (UV-VIS, fluorescence and 1H NMR) and theoretical DFT [(B3LYP/6-31G(d,p)] methods in DMSO and mixed DMSO-H2O system. All the developed sensors showed both naked-eye detectable color change and remarkable fluorescence enhancement in the presence of F- and AcO-. The anion recognition was occurred through the formation of hydrogen bonded complexes between these anions and sensor, followed by the partial deprotonation of sensor. The detection limit of these sensors were down to micro(nano) molar level of F- and AcO-.

Keywords : chemosensors, fluoride, acetate, turn-on, live cells imaging, DFT
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020