

Synthesis, characterization and evaluation of the chemosensory ability of benzothiazolium salts bearing a triphenylamino donor group and an aryl spacer

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Organic salts are the focus of much recent attention, in part due to their stability and the ease of tailoring for specific physical properties. In particular, styryl-pyridinium and benzothiazolium salts have been widely applied in diverse areas such as NLO-phores, frequency-upconversion, optical power limiting, fluorescent probes, laser scanning fluorescence microscopy, molecular switches, etc.¹ The recognition and detection of ionic species has aroused great interest due to their important roles in many biological and environmental processes. Several sensor systems have been developed but most present some limitations in terms of sensitivity, selectivity, and simplicity. Colorimetric chemosensors are molecules that allow naked-eye detection of ionic species without resource to any instrumentation, offering qualitative and quantitative information. These chemical sensors are considered as one of the most effective analytical methods for environmental monitoring, particularly in the detection of metal ions whose presence in the environment has serious consequences. Additionally, chemosensors soluble in aqueous media are very interesting, because of the importance in sensing species in biological processes, disease states and environmental pollution.²

In this communication, we report the synthesis of two benzothiazolium salts **3a-b**, substituted at position 2 with a triphenylamino donor group and an aryl spacer with different electronic character, in order to evaluate their photophysical properties and chemosensory ability. Organic salts **3** were synthesized through Knoevenagel reaction between the precursor aldehydes **2** and 1-methylbenzothiazolium salt **1** in moderate to good yields. The new derivatives were characterized by the usual techniques and a detailed photophysical study was undertaken. The evaluation of the compounds as colorimetric chemosensors was carried out by performing titrations in acetonitrile and acetonitrile/water in the presence of relevant organic and inorganic anions, and of alkaline, alkaline-earth and transition metal cations.

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