

Novel Boronic Acid-Based Fluorescent Sensor for Sugars and Nucleosides

Kaddah A, Sabry S, Emil E, El-Refaei M.

Department of Pediatrics, Cairo University, Cairo, Egypt. dr_amaher@yahoo.com

Abstract

Sugar and nucleoside identifications are important for the detection and treatment of dangerous diseases. In this study, a fluorescent boronic acid (3-(5-(dimethylamino)naphthalene-1-sulfonamido) phenyl)boronic acid (DNSBA) was bound to a diol quencher via a boronic ester linkage, and fluorescence recovery upon exposure to saccharides and nucleosides was demonstrated. Further, we successfully detected sugars and nucleosides in buffer systems. DNSBA expresses selectivity toward adenosine, fructose, sorbitol, and tartaric acid. Our investigations into the effects of pH on sensor sensitivity revealed that changes between the neutral and anionic forms of the boronic acid group, induced at high pH and/or in the presence of sugars or nucleosides, induce visible/optimal changes in DNSBA. DNSBA is responsive at pH = 8.21 whereas acidic media do not exhibit sensitivity. DNSBA can thus be useful in clinical applications as a novel sensor for sugars and nucleosides.

Published In: *Current Organic Synthesis*, 8 (6), pp. 872-880