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Synthesis and carbonic anhydrase activity of some new sulfonamides

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Carbonic anhydrase (CAs) isozymes (EC 4.2.1.1) are being in almost all tissues of living organisms and they catalyse CO_2 hydration to bicarbonate (HCO3-) and protons. Inhibition of these enzymes is clinically in use for various classes of diuretics and systemically acting antiglaucoma agents for a long time. Nowadays, researchers show that they have also effect on acting anticonvulsants, anti-obesity, anti-pain, and antitumor agents/diagnostic tools. These isozymes CA diverge in their catalytic activity, subcellular localization and susceptibility to different classes of inhibitors. Some of them are cytosolic (CA I, CA II, CA III, CA VII and CA XIII), others are membrane bound (CA IV, CA IX, CA XII and CA XIV), two are mitochondrial (CA VA and CA VB), and one is buried in saliva (CA VI). Sulfonamides are well known carbonic anhydrase inhibitors (CAI) and a lot of studies were carried on to improve novel CAI. In this study, twelve 2-oxo-2-((4-sulfamoylphenyl) amino) ethyl 4-substitutedpiperazine-1-carbodithioate were synthesized. The chemical structures of the compounds were elucidated by IR, 1H NMR, 13C NMR and HRMS spectral data. The carbonic anhydrase enzyme inhibitor activity was confirmed by used *in vitro* methods. The results indicated that compound 3d showed good inhibition against hCAI enzyme.