Synthesis and Theoretical Calculations of Carbazole Substituted Pyridopyrimidine Urea/Thioure Derivatives and Studies Their PPO Enzyme Activity

Authors : Arleta Rifati Nixha, Mustafa Arslan, Adem Ergün, Nahit Gencer

Abstract: Polyphenol oxidase (PPO), sometimes referred to as phenol oxidase, catecholase, phenolase, catechol oxidase, or even tyrosinase, is considered to be an o-dipenol. PPO (EC 1.14.18.1), a multifunctional copper containing enzyme, is widely distributed in nature. It catalyzes two distinct reactions of melanin synthesis: a hydroxylation of monophenols to o-diphenols (monophenolase activity) and an oxidation of o-diphenols to o-quinones (diphenolase activity), both using molecular oxygen. Additionaly, investigation demonstrated that various dermatological disorders, such as age spots and freckle, were caused by the accumulation of an excessive level of epidermal pigmentation. Tyrosinase has also been linked to Parkinson's and other neurodegenerative diseases. Nitrogen heterocycles have received a great deal of attention in the literature because of biological properties. Especially, among these heterocyclic systems, pyridine containing compounds have been the subject of expanding research efforts in heteroaromatic and biological chemistry. The pyrido [2,3-d] pyrimidine heterocycles, which are those annelated to a pyrimidine ring, are important because of their wide range of biological and pharmaceutical applications (i.e., bronchodilators, vasodilators) and their anti-allergic, cardiotonic, antihypertensive, and hepatoprotective activities. In this study series of 12 new carbazole substituted pyridopyrimidine urea(thiourea) derivatives were synthesized and evaluated effect on PPO. Additionally, we presented structure-activity relationship analyses and theoretical calculations of the compounds. **Keywords :** carbazole, pyridopyrimidine, urea, thiourea, tyrosinase inhibitors

Conference Title : ICMCE 2015 : International Conference on Materials and Chemical Engineering

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015