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Novel Synthesis of Omeprazole and Pharmaceutical Impurities of Proton pump inhibitors : A Review

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Abstract : The objective of this review was to study the novel methods to the omeprazole synthesis and pharmaceutical impurities of proton pump inhibitors that provide an insight to researchers about the development of proton pump inhibitors. However, this paper emphasized on the study of various pharmaceutical impurities of anti-ulcer drug. The drug used for the study was omeprazole which is chemically known as (5-methoxy-2-[[(4-metboxy-3,5-dimethylpyridinyl) methyl] sulfinyl]-l-benzimidazole) that inhibits gastric ATPase enzyme by oxidizingits sulfhydryl groups.The process involved during synthesis. The novel process come into existence due to incomplete oxidation of pyrmetazole and overoxidation to sulfone that leads to the formation of sulfone N-oxide. The procedure involved 5-methoxy thiobenzimidazole to the formation of an ester followed by coupling of the ester with the Grignard reagent of 2-chloromethyl-4-methoxy-3,5-dimethyl-pyridine. The novel synthesis process for pharmaceutical impurities achieve the expected yield and process observed to be short, simple. The synthesized impurity of proton pump inhibitors can be used as standard impurity, that can be utilized for further studied in various aspects. This review article will describe about the various novel impurities of omeprazole that available as marketed formulation.

Keywords : Proton pump inhibitors, Omeprazole, Grignard reagent, oxidation, Impurity, Synthesis.

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