STABILITY-INDICATING HPLC METHOD OF FORCED DEGRADATION PRODUCTS OF CATECHOLAMINES

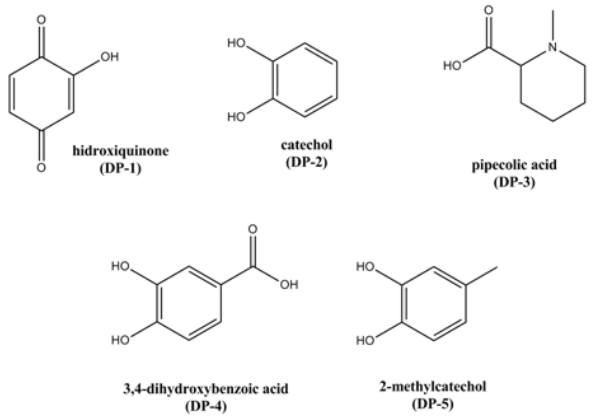
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Abstract

Introdution: Catecholamines (CA) are an important class of neurotransmitters in mammalian central and peripheral nervous systems. Epinephrine and norepinephrine are used in therapy combined with local anesthetic agents because of their vasoconstriction action, thus extending the duration of local anesthesia and reducing bleeding. A major problem of pharmaceutical formulations containing epinephrine or norepinephrine is the low stability of these drugs in solution. In this way, the purpose of this study was to identify and characterized CA degradation products. **Methods:** Catecholamines degradation was tested under forced conditions including alkaline and acidic hydrolysis, oxidation, metallic and photolysis according ICH guideline. The suitability of epinephrine and norepinephrine stability-indicating method was evaluated by the use of a RP-18 column in isocratic elution using octane sulphonate ion pair and methanol as mobile fase. DPs resulted from hydrolysis, oxidative and metallic degradation were subjected to the liquid-liquid extraction with ethyl acetate. All those fractions were analyzed by TLC and HPLC-DAD. Isolated DPs by preparative TLC were characterized by high resolution mass spectrometry (HRMS), 1H-NMR, 13C-NMR and infrared (IR) spectroscopy. **Results and Discussion:** Forced degradation of CA led to the formation of three DPs which have never been previously reported as CA degradation products. **Conclusions**: The identification and characterization of CA DPs enabled us to understand not only the drug's behavior in stressful conditions, but also its DPs formed.

Image



Chemical Strutures of Degradation Produts

Recent Publications

1. Bicker, J.; Fortuna, A.; Alves, G.; Falcão, A. Liquid chromatographic methods for the quantification of catecholamines and their metabolites in several biological samples—A review. *Anal. Chim. Acta*, **2013**, *768*, 12-34.
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4. Yagiela, JA. Vasoconstrictor Agents for Local Anesthesia. *Anesth. Prog.*, **1995**, *42*, 116-120.
5. Grubstein, B.; Milano, E. Stabilization of epinephrine in a local anesthetic injectable solution using reduced levels of sodium metabisulfite and edta, J. Drug Dev. Ind. Pharm., **1992**, 18 (14), 1549-1566.
6. Brown, R.S.; Rhodus, N.L. Epinephrine and local anesthesia revisited. *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.*, **2005**, 100 (4), 401-408.

Biography

Letícia Coli Louvisse de Abreu is professor of Instrumental Analysis at the Federal Institute of Education, Science and Technology of Rio de Janeiro. She was a laboratory technician responsible for the chromatographic analysis (GC-MS and HPLC) in the Industrial Pharmaceutical Technology Laboratory – (Federal University of Rio de Janeiro – UFRJ). PhD in Pharmaceutical Sciences – UFRJ - with emphasis on the development of self-emulsifying drug delivery systems for the treatment of Benign Prostatic Hyperplasia. Master's Degree in Pharmaceutical Sciences-UFRJ (2014) with emphasis on the development and characterization of polymer nanoparticles for prophylaxis of vaginal candidiasis. Specialization in Industrial Pharmaceutical Technology from the Federal University of Rio de Janeiro (2011) Bachelor and Chemistry Degree. Has experience in development and validation of analytical methodology

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