

Validated stability-indicating spectrophotometric methods for the determination of Silodosin in the presence of its degradation products

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Abstract

Five simple, rapid, accurate, and precise spectrophotometric methods are developed for the determination of Silodosin (SLD) in the presence of its acid induced and oxidative induced degradation products. Method A is based on dual wavelength (DW) method; two wavelengths are selected at which the absorbance of the drug is determined by the difference in amplitude between two selected degradation products while for the ratio spectrum of SLD and its oxidative induced degradation product and measured by peak to peak technique at 326 and 588 nm. Method B depends on induced dual wavelength theory (IDW), which is based on selecting two wavelengths on the zero-order spectrum of SLD where the difference in absorbance between them for the spectrum of acid induced degradation products is not equal to zero so through multiplying by the equality factor, the absorption difference is made to be zero for the acid induced degradation product while it is still significant for SLD. Method C is first derivative (1D) spectrophotometry of SLD and its degradation products. Peak amplitudes are measured where the drug is determined by the difference in amplitude between two selected degradation products while for the ratio spectrum of SLD and its oxidative induced degradation product and measured by peak to peak technique at 326 and 588 nm. Method E depends on measuring peak amplitudes of the first derivative of the ratio spectrum of SLD and its oxidative induced degradation product and measured by peak to peak technique at 326 and 588 nm. The calibration curves for all the proposed methods are linear over a concentration range of 7.692–92.5 g/mL. The selectivity of the proposed methods was tested using different laboratory prepared mixtures of SLD with either its acid induced or oxidative induced degradation products showing specificity of SLD with accepted recovery values. The proposed methods have been successfully applied to the analysis of SLD in pharmaceutical dosage forms without interference from additives.

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 2018, September