

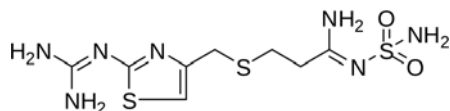
¹⁴N Nuclear Quadrupole Resonance Study of Polymorphism in Famotidine for More Reliable Detection of Counterfeit Medicines

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Famotidine is an excellent histamine H₂ receptor antagonist. It crystallizes in two different stable polymorphic forms. Both polymorphs belong to the monoclinic crystal system with different unit cell dimensions. Since polymorphism can influence the aqueous solubility of a pharmacologically active ingredient, the drug's physico-chemical characterization is of great importance.

¹⁴N nuclear quadrupole resonance (NQR) in two known polymorphs of famotidine was measured at room temperature. Seven triplets of transition frequencies (in the interval 0.46 MHz -3.46 MHz) were found corresponding to seven different nitrogen sites in the crystal structure for both polymorphs showing the ability of NQR to clearly distinguish between different polymorphs.



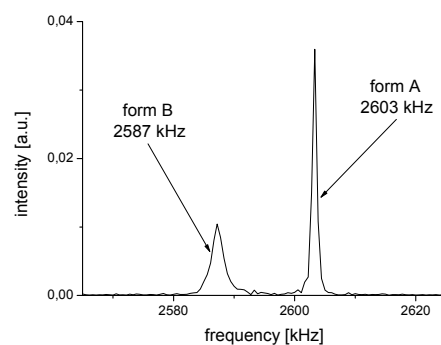


Figure 1. A typical characteristic part of ¹⁴N NQR room temperature spectrum for a mixed sample of forms A and B famotidine (approximately 75 % form A and 25 % form B)

Suitable NQR spectral regions with close line pairs belonging to different famotidine polymorphs were located to monitor the polymorph proportions in the solid mixture in the common spectral window simultaneously (Fig.1).

The influence of the compacting pressure used in famotidine tablet-fabrication on the NQR line-widths has also been determined.

⁺ J. Lužnik: Deceased