

STUDY OF VITAMINS AND DIETARY SUPPLEMENTS CONTAINING FERROUS FUMARATE AND FERROUS SULFATE USING MÖSSBAUER SPECTROSCOPY

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Mössbauer spectroscopy is a useful tool to study various materials including pharmaceuticals. Study of different iron containing vitamins and dietary supplements using the Mössbauer spectroscopy revealed various ferrous and ferric impurities. In the present work we consider results of the application of the Mössbauer spectroscopy with a high velocity resolution to study several new vitamins and dietary supplements containing ferrous fumarate ($\text{FeC}_4\text{H}_2\text{O}_4$) such as Elevit, Vitrum, Children's Multi Vitamin and Multi For Her, and ferrous sulfate (FeSO_4) such as Sorbifer Durules, Hemofer® and Falvit®. Mössbauer spectra of all samples were measured at 295 K in 4096 channels. The Mössbauer spectra of samples containing ferrous fumarate were considered for analysis in 2048 channels while those of other samples in 4096 channels. The analysis of the spectra revealed the presence of different components with various relative contributions. As the main component in the spectra of vitamins and dietary supplements containing ferrous fumarate was identified $\text{FeC}_4\text{H}_2\text{O}_4$ while that in the spectra of other samples as FeSO_4 . The minor components were related to ferrous and ferric compounds which may be due to impurities or results of some transformation of ferrous

fumarate or ferrous sulfate. It is interesting to observe small variations of Mössbauer hyperfine parameters for ferrous fumarate and ferrous sulfate in corresponding samples (Fig. 1). This fact may be a result of different preparation methods or/and purity of ingredients used by various manufacturers in the production process.

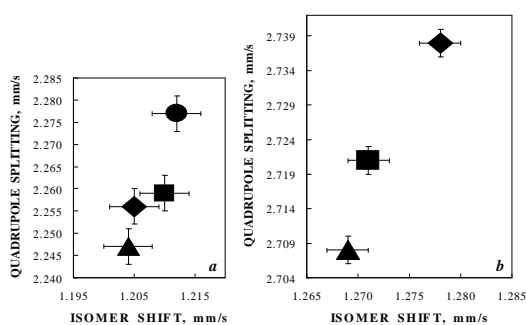


Fig. 1. Plots of Mössbauer hyperfine parameters for ferrous fumarate (a) in Elevit (◆), Vitrum (■), Children's Multi

Vitamin (▲) and Multi For Her (●), and for ferrous sulfate (b) in Sorbifer Durules (◆), Hemofer® (■) and Falvit® (▲).

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