

Title	Multivariate quantification of mebendazole polymorphs by terahertz time domain spectroscopy (THZ-TDS)
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Abstract	This work presents an analytical method based on terahertz-time domain spectroscopy (THz-TDS) and partial least squares (PLS) regression models to quantify mebendazole (MBZ) polymorphs (forms A, B and C) in pharmaceutical raw material. Mebendazole polymorphs A, B and C were quantified with RMSEP values of 1.5% w/w, 1.2% w/w and 1.8% w/w, respectively. The limits of detection (LOD) ranges obtained with the best PLS regression models were 2.7–4.3% w/w, 2.9–4.0% w/w and 2.4–3.1% w/w, for polymorphs A, B and C, respectively. This analytical performance is better than those for the methods described in the literature using near (NIR) and middle (MIR) infrared spectroscopies. The main advantage of THz spectroscopy is its ability to access directly information related to crystal lattices. According to the results, the developed method is a powerful technique for the quantification of MBZ polymorphs in raw material. This methodology can be implemented as a Process Analytical Technology (PAT) tool for quality control of pharmaceutical feedstock.
Laser Quantum Product	HASSP-THz
Institute	Analyst