Detection and Quantitation of Solithromycin Form II in Solithromycin Capsules, 200 mg by X-ray Powder Diffraction

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RESULTS AND DISCUSSION

The sample's X-ray powder pattern between 2-40° is visually compared to a previously collected reference powder pattern of solithromycin capsule formulation. The data analysis software is used to tabulate the positions of characteristic Form II peaks, which are obtained at 5.5°, 7.7°, 9.2°, 11.5° and 12.8°. From Figure 1, it may be inferred that the peaks at 7.7°, 9.2° and 11.5° are characteristic of Form II and are not obscured by peaks due to Form I drug substance or those due to excipients in solithromycin capsules.

DOE batches after the wet granulation and subsequent drying processes during manufacturing. Figure 6 shows representative X-ray powder patterns of two of the DOE batches after the blending step in the capsule manufacturing process. Figure 7 shows representative X-ray powder patterns of two of the DOE batches after the encapsulation step during manufacturing. All DOE batches showed similar patterns.

Table 1: Summary of X-ray Powder Patterns

The pre-validation method was followed in the first step, the pre-validation linearity evaluation. A linearity study spiking 1.0%, 3.1%, 5.0%, and 10.0% Form II into capsule formulations was conducted to determine the limit of detection (LOD) and limit of quantitation (LOQ). LOD and LOQ for Form II were determined at 0.015° and 0.025°, respectively. LOD and LOQ for the greatest R² values with the most accurate data fit were chosen for further method validation.

Table 2: X-ray Powder Patterns for Sample Analysis

The method was suitable for detecting and quantitating polymorphic changes within the drug product during its shelf life.

CONCLUSIONS

The X-ray powder patterns of capsule formulations with Form II were successfully performed and it was demonstrated that the method is suitable for detection and quantification of solithromycin Form II in capsule formulations.

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