事例研究

識別困難なNIR波形データに対する分割合成法の適用

Application of Multi-Mahalanobis-Taguchi Method to Near-infrared Waveform Data for Drugs That are Difficult to Identify

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Pharmaceuticals and their raw materials must be inspected when shipped and received, but depending on their condition, it can be difficult to judge their properties or identify abnormalities based only on their appearance. Highperformance liquid chromatography（HPLC）could be employed, but this method is not suitable for product quality inspection because it is destructive and time-consuming. For quick non-destructive inspection, an alternative method uses near-infrared light. In particular, there is an optical method（NIRS）that identifies components from the shape of their absorption waveforms. Since this is a simple procedure, we applied the Mahalanobis-Taguchi（MT）method to the NIRS test results of all prescriptions handled at an office and attempted to identify each. In this report, we focus on prescriptions that are not particularly easy to identify, which we investigated by using a divisional synthesis method. As a result, we confirmed that identifiability was improved by simply dividing all prescriptions into two or three groups. For prescriptions that were difficult to identify, we were able to improve their identifiability by applying item diagnosis using orthogonal arrays to judge their validity.

Key words：near infrared spectroscopy, kampo medicine, Mahalanobis distance, Inspection, Maharanobis-Taguchi system, multi MT method, quality engineering, Taguchi methods, S/N ratio

1. はじめに

一般に検査等において，打音の聴覚による微妙な相違や，視覚による観測データである波形等，人の五感による正常状態からの逸脱の判断や予測を行うような場面は少なくない。また物理的，機械的にすぐには異常の判断ができなくても，五感によるヒトの感覚では即座の検知が可能となるようなケースについて，MT法での識別が容易でない場合がある。単位空間のばらつきが大きすぎたり，元データにおける識別に関わる特徴部分がわずかしかないことな

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