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ACTIVE SUBSTANCES FOR NEW DRUGS – PURITY DETERMINATION WITH NEW DSC TECHNOLOGY AND SEPARATION PROCESS USING LIQUID FLASH CHROMATOGRAPHY

Słowa kluczowe:

leki, DSC, związki aktywne, kalorymetria, analiza termiczna, chromatografia Flash, oczyszczanie

Streszczenie

Głównym celem przeprowadzonych pomiarów było określenie czystości substancji czynnych stosowanych do produkcji leków przy użyciu różnicowej kalorymetrii skaningowej (DSC). Cel osiągnięto przy wykorzystaniu nowego typu instrumentu DSC do analizy termicznej Linseis HAAS, który zamiast konfiguracji z dwoma tyglami wykorzystuje ceramiczny chip z jednym tyglem.

Piśmiennictwo

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Abstract

Thermal analysis methods allow the identification, determination of purity, and compatibility of medicinal substances with the reference substance in the testing processes. Thanks to the diversity of these methods, it is possible to study the composition and physicochemical properties of new biologically active compounds, study the thermostability of medicinal substances, predict possible interactions between the drugs and the excipient, test polymorphic forms and pre-formulation of new drugs.

Measurements were conducted using differential scanning calorimeter Chip-DSC 10 (Figure 1) Linseis HAAS with a unique ceramic sensor, which already incorporates an in-build reference side. The experiment was done in crimped aluminum crucibles in the air. The heating rate was set to 20 K/min. Each measurement was performed three times using each time a sample of app. 4 - 7 mg mass.

Figure 1. Differential scanning calorimetry setup Chip-DSC 10 with unique Linseis ceramic sensor

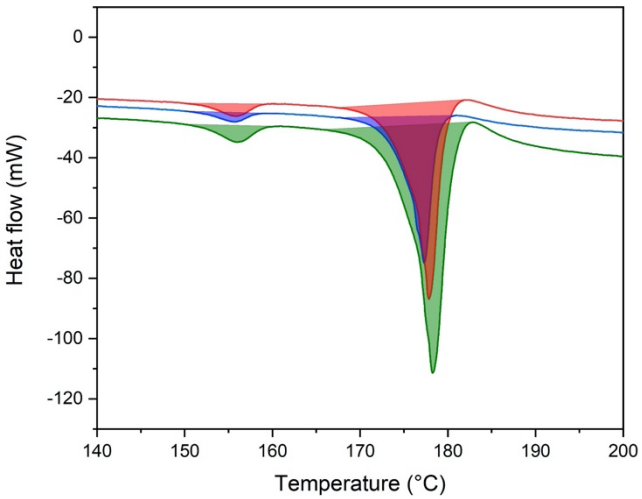

Figure 2. Three consecutive DSC measurements of the selected sample with impurities

The measurements show that the novel design of the Chip-DSC with a ceramic chip can support accurate and repeatable results. Even small amounts of impurities are possible to detect within minutes (Figure 2). Fast measurements, low cost, and small size of the device make it available also for small laboratories that need to quickly examine the purity of the received materials or synthesized substances. To learn more about the samples, further analysis is planned using additional techniques, thermogravimetry (TGA and STA), or evolved gas coupled techniques, TGA+FTIR or TGA+MS. Further purification of impurities will be performed with liquid Flash Chromatography, on selected Flash columns – 12 g in research scale, 5-10 kg Santai Flash chromatography columns for scale-up and production scale (Figure 3).

Figure 3. Flash Chromatography setup SepaBean L for purification and separation up to 1 L/min, up to 1 kg compound on 10 kg column

Informacja

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