

# Abstract

## Non-silica based materials in the drug analysis I.

Diploma thesis

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The analysis of various samples is mostly carried out by chromatographic techniques, which are considered to be the most sensitive. However it is often necessary to pretreat samples before the analysis by an appropriate method in order to eliminate interferences. The solid-phase extraction is one of the techniques, which uses solid sorbent for extraction of active substances from liquid medium. Most of these materials are based on silica gel. Our research was focused on non-silica stationary phases based on zirconium dioxide and titanium dioxide. According to available information, these two materials have a significant potential for application in the area of analysis. We tested their properties on samples containing acidic analytes without plasma first in mode with retention of polar compound in aqueous environment, then in HILIC mode. Model acids were washed out from  $\text{TiO}_2$  sorbent in aqueous medium, whereas they were released from  $\text{ZrO}_2$  after elution by 5%  $\text{NH}_3$ . HILIC conditions led to higher recovery on the  $\text{TiO}_2$  sorbent after elution by 50% ACN, however better results were again achieved on  $\text{ZrO}_2$ . We studied the extraction ability of these sorbents also for biologic samples containing plasma. In aqueous medium better results were achieved on the  $\text{ZrO}_2$ -SAX sorbent than on  $\text{TiO}_2$  after elution by 5%  $\text{NH}_3$ . Only few acids were sufficiently retained on  $\text{TiO}_2$  under HILIC conditions.

Keywords: SPE,  $\text{TiO}_2$ ,  $\text{ZrO}_2$