

SEPARATION OF FLUORINATED AMINES BY COLUMN CHROMATOGRAPHY ON MIL-53 ALUMINIUM FUMARATE $[\text{Al}(\text{OH})(\text{fum})]_n$

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Fluorinated compounds are widely used in pharmacy and agrochemistry. Separation of amines is an important task for organic chemistry and analysis. Search of new carriers for chromatographic separation of fluorinated and non-fluorinated amines and determination of factors that influence efficiency of such compounds separation is an important task of modern physical chemistry. Porous coordination polymers, or metal-organic frameworks (MOFs), are promising compounds for sorption and chromatographic separation of various compounds.

The aim of this study was to reveal the possibility of fluorinated amines separation using aluminium fumarate – $[\text{Al}(\text{OH})(\text{fum})]_n$ (fum^{2-} = dianion of *trans*-1,2-ethylenedicarboxylic acid) which is referred to MIL-53 structural type [1]. The framework of this compound contains 1D pores with size ca. $6 \times 6 \text{ \AA}^2$, which can be filled with substrate.

It was found that the column with $[\text{Al}(\text{OH})(\text{fum})]_n$ allows separating isomeric nitroamines and fluorinated nitroamines in pair, shown on Fig. 1. Experiments were performed using the mixtures of *n*-hexane methyl-*tert*-butylether as eluent. The eluted compounds were identified by thin layer chromatography by comparison with standards. In the cases of 2-amino-5-fluoronitrobenzene/2-amino-nitrobenzene and 2-amino-4-fluoronitrobenzene/2-amino-3-fluoronitrobenzene the order of compounds elution from the column filled with $[\text{Al}(\text{OH})(\text{fum})]_n$ was inverted compared to the ratio of R_f on silicagel. It can be noted that separation efficiency improves with increase of $\log P$ difference (where $\log P$ is the measure of compound hydrophobicity [2]).

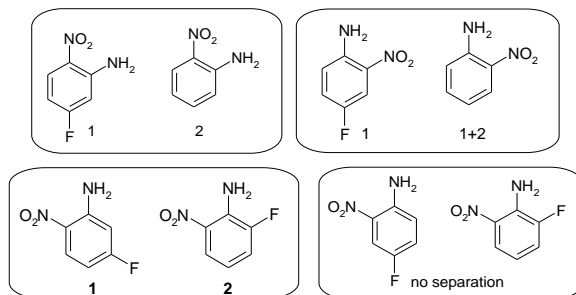


Fig. 1. Formulae of compound pairs, which were examined. The digits indicate the order of elution from the column

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