

Review of a Ph.D. thesis of the student Michael Meurer with the title “Testing of Pressure Sensitive Adhesives for Transdermal Therapeutic Systems”

The topic of this thesis is fascinating, and many laboratories all over the world study transdermal therapeutic systems (TTS) and pressure-sensitive adhesives (PSA). An essential factor is trauma-less removal after several days of application on the skin.

The experimental work focuses on TTS containing PSA, active pharmaceutical ingredients (API), and a protective backing layer. Testing methods focus on adhesion measurement (probe tack, peel, and static shear adhesion).

The aim of this work is the development of application-related and tailor-made characterizing and testing methods for TTS with a focus on:

- 1) development of a testing approach to determine adhesion and detaching of PSA/TTS
- 2) viscoelastic properties of PSA/TTS subjected to small and large deformations
- 3) determination and evaluation of the diffusion behavior of water-based liquids into the PSA, also considering cross-interactions with API and their effects on the viscoelastic properties.

The whole thesis consists of 74 pages. In the 23 pages of the introduction, the student explained the background and aim of the research well. Then, he wrote a discussion of the results and conclusions. He has listed 136 references.

He wrote four papers, two of which were already published in journals listed in Web of Science.

Altogether, this research was performed on a high level with many experiments. The student has shown the ability to study literature, perform experiments, analyze experiments, and summarize them into well-arranged form.

This doctoral thesis does not contain visible flaws, so I recommend it for defense.

I have checked the Web of Science and found two papers with his name; he is listed as the first author. He already has 3 citations (without self-citation), h-index is 1. This is enough to grant a Ph.D. title.

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[1] Meurer M, Kádár R, Ramakers-van Dorp E, Möglinger B, Hausnerova B. Nonlinear oscillatory shear tests of pressure-sensitive adhesives (PSAs) designed for transdermal therapeutic systems (TTS). *Rheologica Acta*. 2021;60(10):553-570. <https://doi.org/10.1007/s00397-021-01280-6>.

[2] Meurer M, Prescher T, Ramakers-van Dorp E, Möglinger B, Hausnerova B. RheoTack-An approach to investigate retraction rate dependent detaching behavior of pressure sensitive adhesives. *Journal of Rheology*. 2022;66(3):505-514. <https://doi.org/10.1122/8.0000405>.

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RheoTack-An approach to investigate retraction rate dependent detaching behavior of pressure sensitive adhesives

[Meurer, M](#); [Prescher, T](#); (...); [Hausnerova, B](#)

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[Meurer, M](#); [Kádár, R](#); (...); [Hausnerova, B](#)

Oct 2021 | Jul 2021 (Early Access) | [RHEOLOGICA ACTA](#) 60 (10) , pp.553-570

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