UNIVERSITY OF CHEMISTRY AND TECHNOLOGY, PRAGUE
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Prague, June 28, 2021

Review on the Habilitation thesis of MSc. Fatma Yalcinkaya, Ph.D.

Dr. Fatma Yalcinkaya submitted her habilitation thesis titled "One-dimensional nanofibers: Application in membrane technology". The thesis consists of several chapters covering her scientific activities and selected scientific papers.

The habilitation thesis deals with problems related to the production of polymer nanofibers by the electro-spinning techniques and applications of the produced fibers in membrane technology.

Chapter 2 – Nanofiber technology
Dr. Yalcinkaya describes the needle-assisted and needle-free techniques that are used for the production of nanofibers under applied electric field. Parameters affecting the performance of the electro-spinning systems are listed and discussed. A reader can find basic information about the behavior of electro-spinning devices under various conditions and obtain feeling about their control. This chapter documents expertise of dr. Yalcinkaya in the electro-spinning technology. The process of the Taylor conus formation und underlying phenomena are not described in detail. The equations (2.2)-(2.4) seem to be correct; however, they are written in a non-standard form.

Chapter 3 – Nanofibrous membranes
This large chapter describes the fundamentals of membrane technologies as well as the use of nanofibers in membrane technology. The chapter can serve as a basic textbook for technologists and students dealing with membrane separations. They can find information on membrane morphology, membrane modules, and parameters of membrane separations. Special sections are devoted to the concentration polarization and membrane fouling problems. The most important part of this chapter describes the applications of fibrous materials in membrane technologies. The chapter is written in good English. I think that instead "is greater than 90C" should be written "is greater than 90 degrees" in page 19.

Chapter 4 – Presented works and their novelties
Dr. Yalcinkaya comments on her own scientific efforts in this chapter. She divided this part into three sub-chapters. The first chapter is focused on the screening of blends to form fibrous materials for wastewater treatment applications. The next chapter reports on the process of fiber transformation to membranes for applications in aqueous environment. The

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optimization of lamination techniques is emphasized. The last chapter focuses on the possibilities of the surface modification of fibrous membranes for oil-water separations. The fibrous material was also successfully tested as a mechanical support of composite membranes for enantiomer separations.

Overall assessment

I can conclude that the submitted habilitation thesis indicates a high level of expertise of dr. Fatma Yalcinkaya in the electro-spinning technologies and related membrane applications. She has a broad overview of the issue and can educate PhD students in her field. Her current citation report: 35 peer-reviewed papers, H-index = 14, number of citations: 348 (239 without self-citations).

Topics for discussion

Page 20. Is the statement "Negatively charged membrane surface helps to reject dissolved salts, microorganisms and ... " correct? Salts always consist of an cation and anion. How the salt can be repelled? Are all microorganisms under all conditions negatively charged?

Page 32. How is TOC coupled with the membrane characterization? TOC is a water property.

Page 36. Is the use of nanofibers in veils safe? Can fibrous material in them irritate lungs?

Page 37. Is there a systematic approach to design new blends for particular applications?

Page 49. Does her work provide any specific recommendations on how to design membranes for wastewater applications?

Based on the above comments and overall scientific achievement, I am pleased to recommend awarding the title of Associate Professor ("Docent") to MSc. Fatma Yalcinkaya, Ph.D.