Supplementary Information S3

Interactions of polyvinyl acetate dispersions with nanostructured superhydrophilic and superhydrophobic Ti6Al4V alloy surfaces

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S3: UV-grafting of PDMS to Ti6Al4V alloy and analysis of wetting properties

In order to show the necessity of the nanostructure for anti-fouling performance, PDMS was applied to a solvent cleaned Ti6Al4V surface as described in the main manuscript (section 2.3). DRIFT spectroscopy as well as surface wetting analysis were carried out to confirm the successful surface modification and to demonstrate hydrophobic surface characteristics.

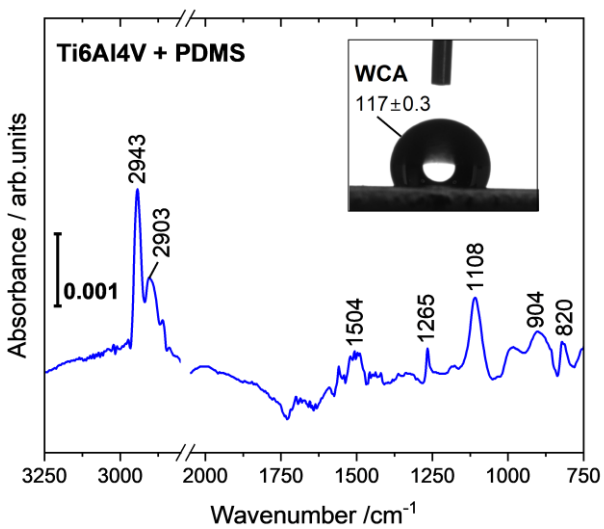

Fig.S3 DRIFT spectrum of PDMS as deposited onto the solvent cleaned Ti6Al4V alloy surface with water contact angle of the modified surface as insert

The DRIFT spectrum exhibits the PDMS-typical IR-vibrations, which are the CH-stretching vibrations of CH_3 groups (2943 cm^{-1} and 2903 cm^{-1}), the CH_3 symmetric bending and rocking in Si-CH_3 (1265 cm^{-1} and 820 cm^{-1}) as well as the absorption band for the siloxane network in PDMS (1108 cm^{-1}). [1, 2] The water contact angle was determined to be 117 ± 0.3°, which demonstrates strong hydrophobic surface properties. Therefore, both analyses consistently evidence a successful surface modification.

1 Literature

[1] Lee J, Kim J, Kim H, Bae YM, Lee K-H, Cho HJ (2013) Effect of thermal treatment on the chemical resistance of polydimethylsiloxane for microfluidic devices. J. Micromech. Microeng. 23(3):35007. https://doi.org/ 10.1088/0960-1317/23/3/035007.

[2] Shi D and Li P (2016) Preparation of PDMS/PVDF Composite Pervaporation Membrane Modified with Hydrophobic TiO2 Nanoparticles for Separating Formaldehyde Solution. Polym Sci 2(1). https://doi.org/ 10.4172/2471-9935.100012.