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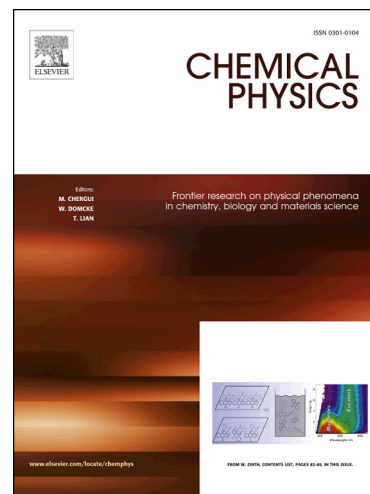
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Friction coefficient between a hydrophobic soft solid surface and a fluid: determined by QCM-D

Rosalba Patiño-Herrera^{a,b,*}, R. Catarino-Centeno^c, Armando Gama Goicochea^{d,e,f}, Marissa Robles-Martínez^b, Ramiro Rico Martínez^a, Elías Pérez^d

^a Departamento de Ingeniería Química, Instituto Tecnológico de Celaya (Tecnológico Nacional de México), Av. Tecnológico y Antonio García Cubas s/n. Celaya, Guanajuato 38010, Mexico.

^b Doctorado en Ingeniería y Ciencia de Materiales de la UASLP, Sierra Leona 530, San Luis Potosí, 78210, Mexico.

^c Facultad de Ciencias, ^d Instituto de Física, UASLP, Álvaro Obregón 64, San Luis Potosí, 78000, Mexico.

^e Innovación y Desarrollo en Materiales Avanzado A. C., Grupo Polynnova, San Luis Potosí, Mexico

^f Tecnológico de Estudios Superiores de Ecatepec, Av. Tecnológico s/n C.P. 55210, Ecatepec de Morelos, Mexico.

*Corresponding author

Telephone: +52 (461) 61 17575 to 5559

Fax number: +52 (461) 61 17575 to 5557

email address: roos_ph@iqcelaya.itc.mx

Abstract

Quartz crystal microbalance with dissipation (QCM-D) response data was used to determine the friction coefficient (μ) between soft solid surface and ethanol. A self-assembly of Dodecanethiol (DCT) film on gold was carried out. The number of DCT grafted (Γ) onto gold surface was investigated at concentrated solutions (10-33% v/v). Such large concentration leads to an increase on grafting density, viscosity, roughness and water contact angle favoring the reduction of friction coefficient (~ 0.0922). These results allow proposing a soft self-assembled hydrophobic film to reduce friction between fluids into conduit, tube, or some other device.

Keywords: QCM-D, Friction coefficient, hydrophobic film, highly concentrated solutions, lubricant.

1. INTRODUCTION

When a fluid flows through a conduit, tube, or some other device, energy loss occurs due to friction between liquid and pipe wall as result of the decrease in pressure between two

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