

Robust anti-fouling and anti-icing surfaces

Naureen Akhtar, Bodil Holst

*Department of Physics and Technology, University of Bergen, P.O. Box 7803, N-5020,
Bergen, Norway*

Naureen.Akhtar@uib.no

Build-up of contamination on exposed surfaces results in operational difficulties and high maintenance efforts in many outdoor infrastructures operating under severe conditions such as marine and arctic environment. Moreover, ice and frost on optical windows used in cameras and sensors on environmental monitoring systems pose a major problem of accuracy in the measurements. To deal with these issues, various active methods are employed for contamination and ice/frost removal, typically involving continuous electric power, chemicals, hot air and manual cleaning. Hence, making the surface anti-fouling and anti-icing would be highly desirable.

Here we present strategies to develop anti-fouling and anti-icing surfaces for optics-based technology (sensors, cameras), used in a wide range of environmental monitoring instruments suitable for severe environmental conditions - in particular arctic conditions. Because of the severe conditions the window material need to be very robust and therefore sapphire, one of the hardest material in nature, is normally used. Sapphire is the crystalline form of Al_2O_3 and the surface is very unreactive (no oxidation etc.)