Electronic Supplementary Material (ESI) for Materials Advances.
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Electronic Supplementary Information (ESI)

Low ice adhesion anti-icing coatings based on PEG release from mesoporous silica particles loaded SBS

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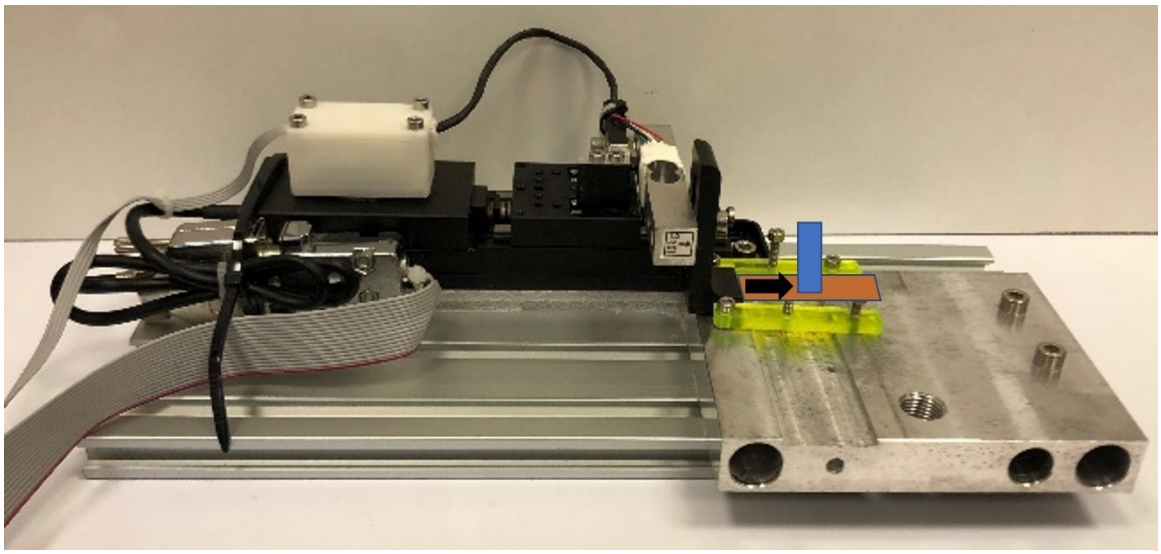
a)



b)

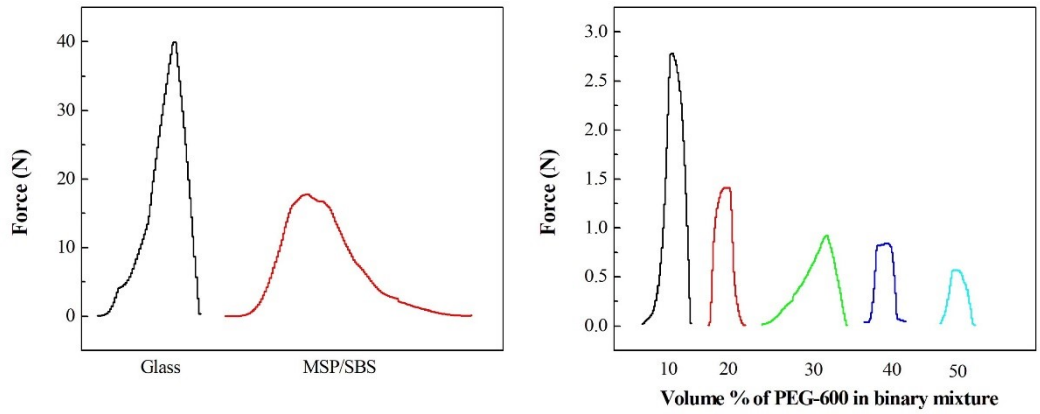
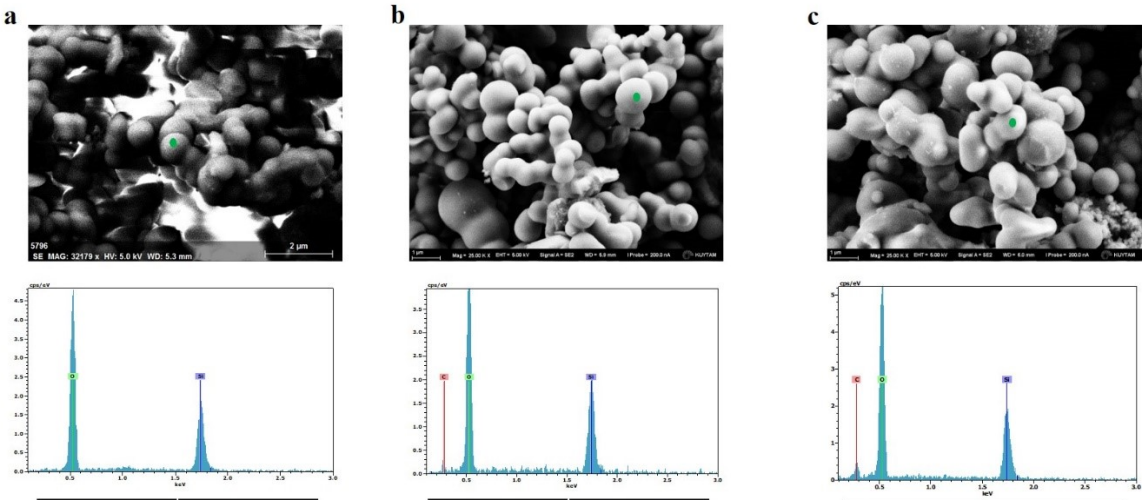


Fig. S1. a) Ice adhesion measurement setup: the sample (brown), ice column (blue), direction in which the force is applied (black arrow). b) Force on the ice column measured on different samples: glass, unfilled MSP/SBS, PEG-filled MSP/SBS in 10%, 20%, 30%, 40%, 50% by volume PEG-600 solutions. The maximum force to detach the ice column was divided by the apparent cross-sectional area of the ice-composite interface to obtain the ice adhesion strength.



Elements	Atomic percentage
O	69.33
Si	30.67
C	0.0

Elements	Atomic percentage
O	65.59
Si	28.88
C	5.53

Elements	Atomic percentage
O	63.59
Si	26.87
C	9.54

Fig. S2. SEM images and EDX analysis of unfilled and PEG-filled MSP: (a) unfilled MSP, (b) MSP filled in 0.1 g mL^{-1} PEG solution, (c) MSP filled in 0.3 g mL^{-1} PEG solution. The atomic percent of carbon increased with the filling solution concentration of PEG from 5.5 % at 0.1 g mL^{-1} filling concentration to 9.5 % at 0.3 g mL^{-1} filling concentration.

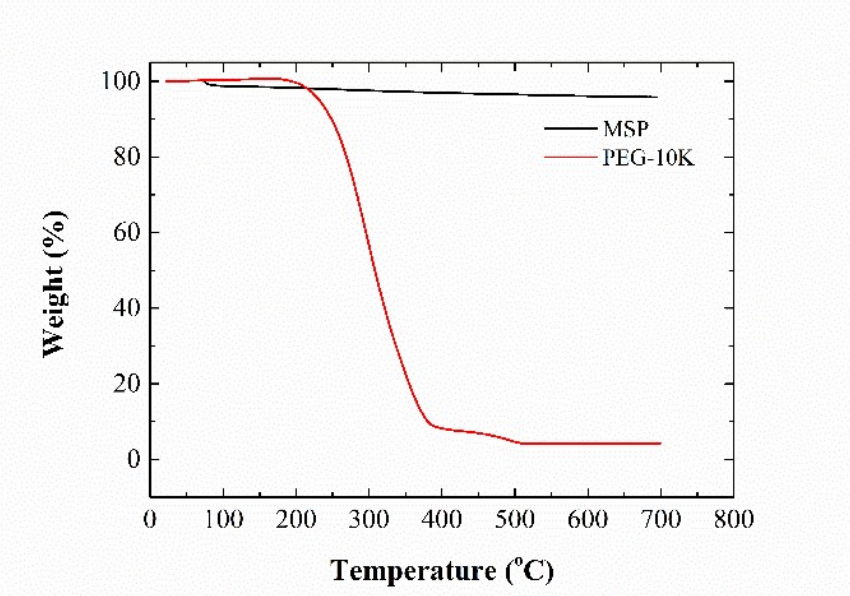


Fig. S3. TGA characterization of calcined MSP (black line) and PEG-10K (red line). Unfilled MSP showed a total mass loss of 4.5% due to physically adsorbed water.

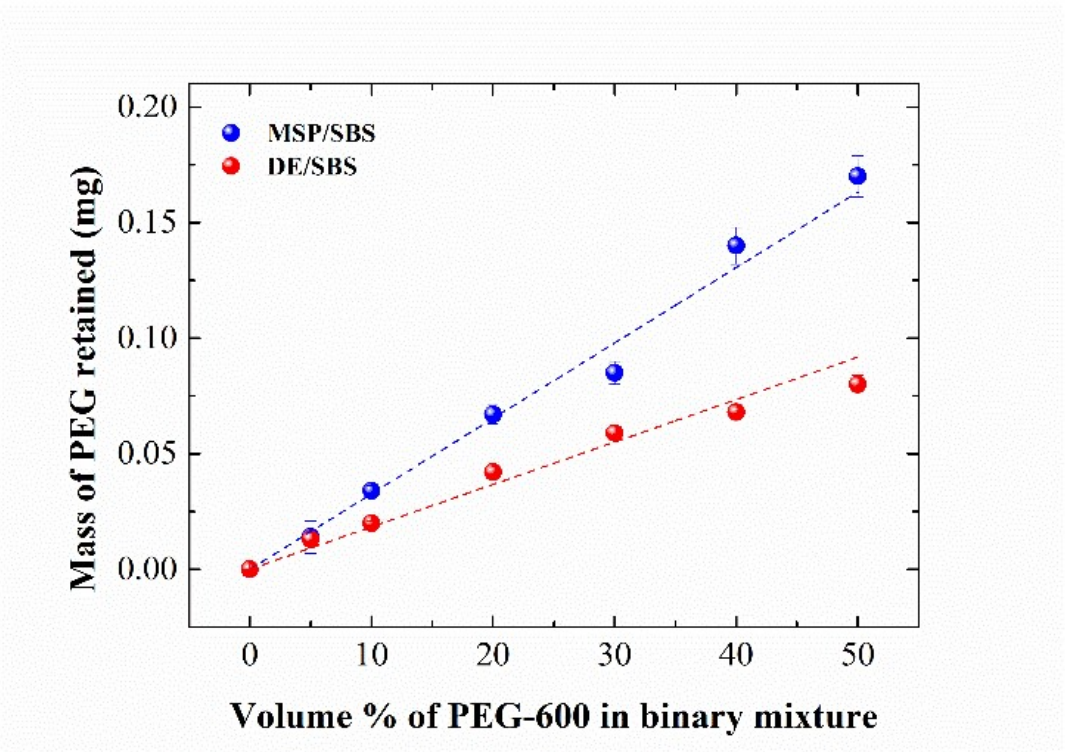


Fig. S4. Comparison of amount of PEG-600 retained in 1 mg of MSP/SBS and DE/SBS composites. MSP/SBS composites retained ~2 times more PEG-600 as compared to DE/SBS composites (30 % silica by weight in both) at the PEG-600 concentration of 50% by volume in the binary mixture.

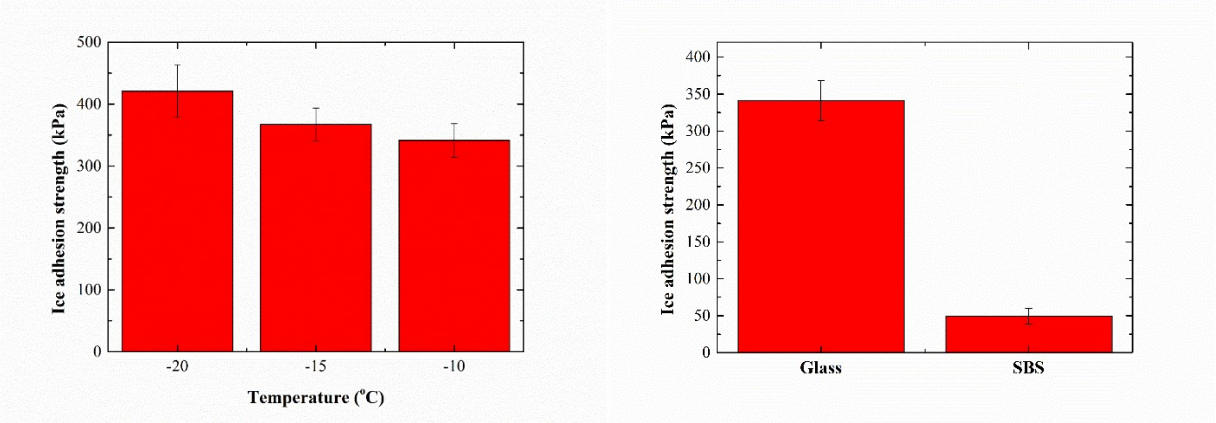


Fig. S5. a) Ice adhesion strength on uncoated glass slides as a function of measurement temperature, b) Comparison of ice adhesion strength of glass slides and SBS coatings at -10 °C.

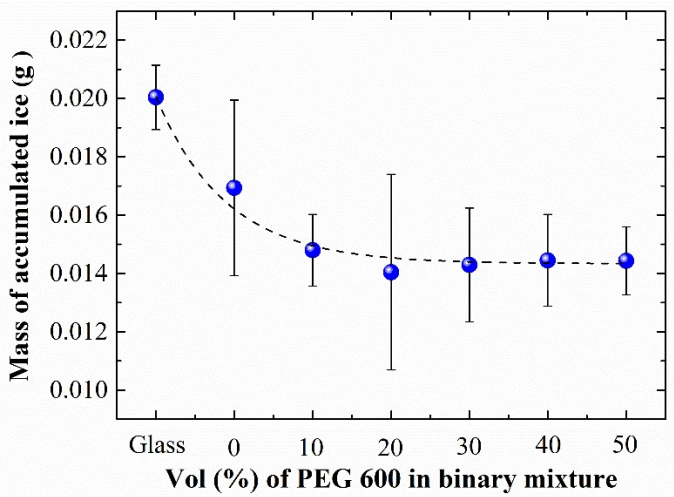


Fig. S6. The mass of accumulated frost induced by spraying water droplets at 0 ºC onto inclined (by 45º) PEG-filled MSP/SBS composites at -10 ºC as a function of PEG-600 concentration in the binary solvent in which the composites were filled.