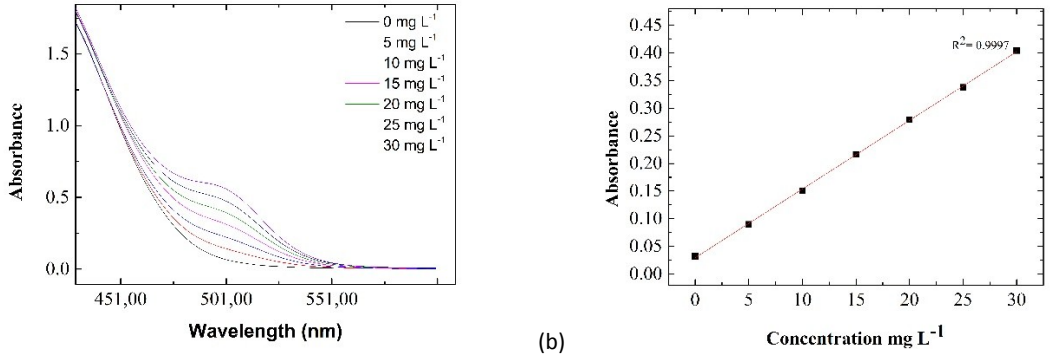
Electronic Supplementary Information

Anti-icing agent releasing diatomaceous earth/SBS composites

A. Ijaz,[a] A. Miko[b] and A. L. Demirel[a,b]

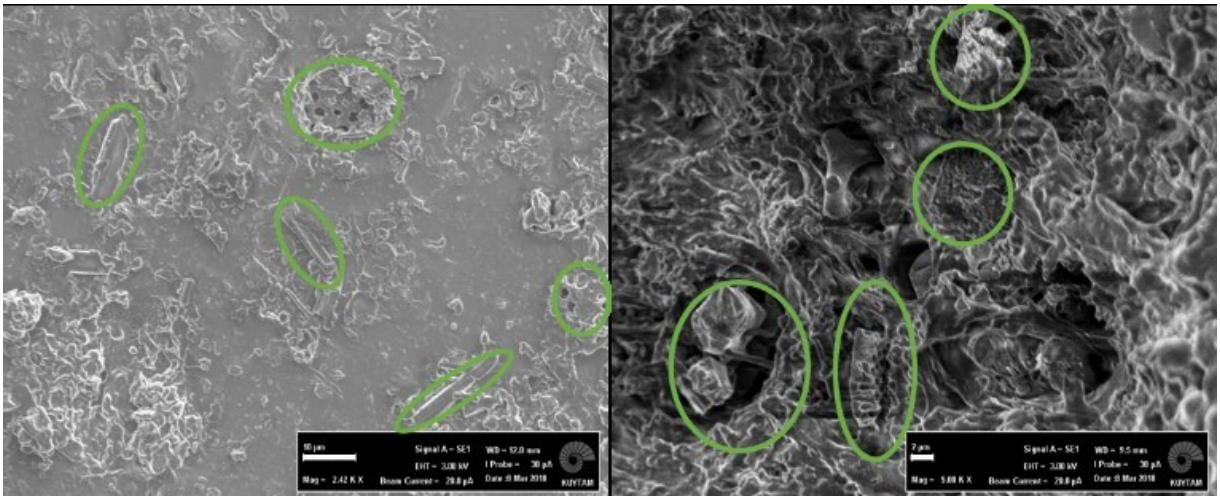
[a] Materials Science and Engineering Program, Koç University, Istanbul, Turkey.

[b] Chemistry Department, Koç University, Istanbul, Turkey.



(a) (b)

Fig. S1 Calibration for PEG-10K released from the composite into water at room temperature by UV-Visible spectroscopy using modified Dragendorff method: (a) Absorption spectra of the complex formed by mixing PEG-10K at various concentrations and Dragendorff reagent (DR). (b) Calibration curve at 514 nm for PEG-10K.



(a) (b)

Fig. S2 Low magnification SEM images of PEG-10K filled DE/SBS composite: a) the top surface b) the fractured cross section. The circled areas highlight the DE particles in the SBS matrix. The scale bar corresponds to 10 μm in (a) and 2 μm in (b).

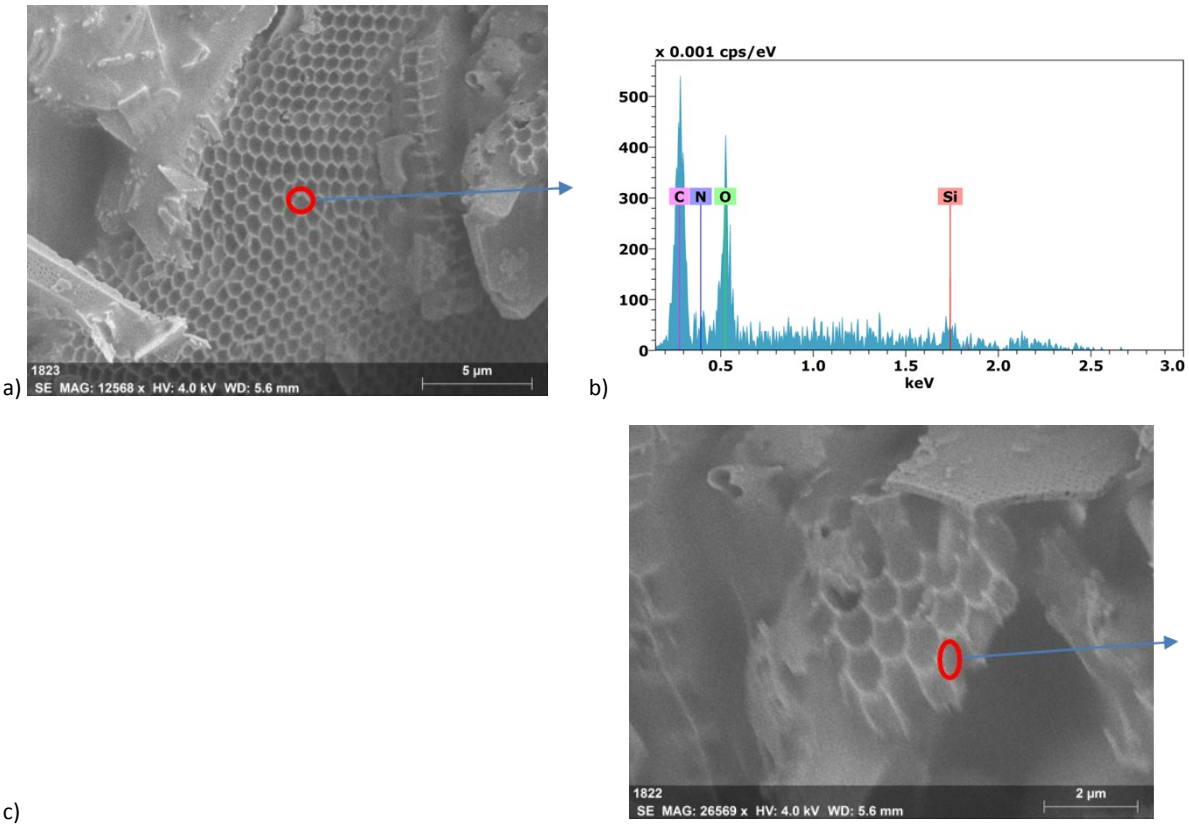


Fig. S3 SEM micrographs (a and c) and EDX analysis (b and d) for diatomaceous earth (DE) particles kept in PEOX-5K solutions in acetone and centrifuged. The nitrogen peak in EDX results shows the presence of PEOX in DE pores.

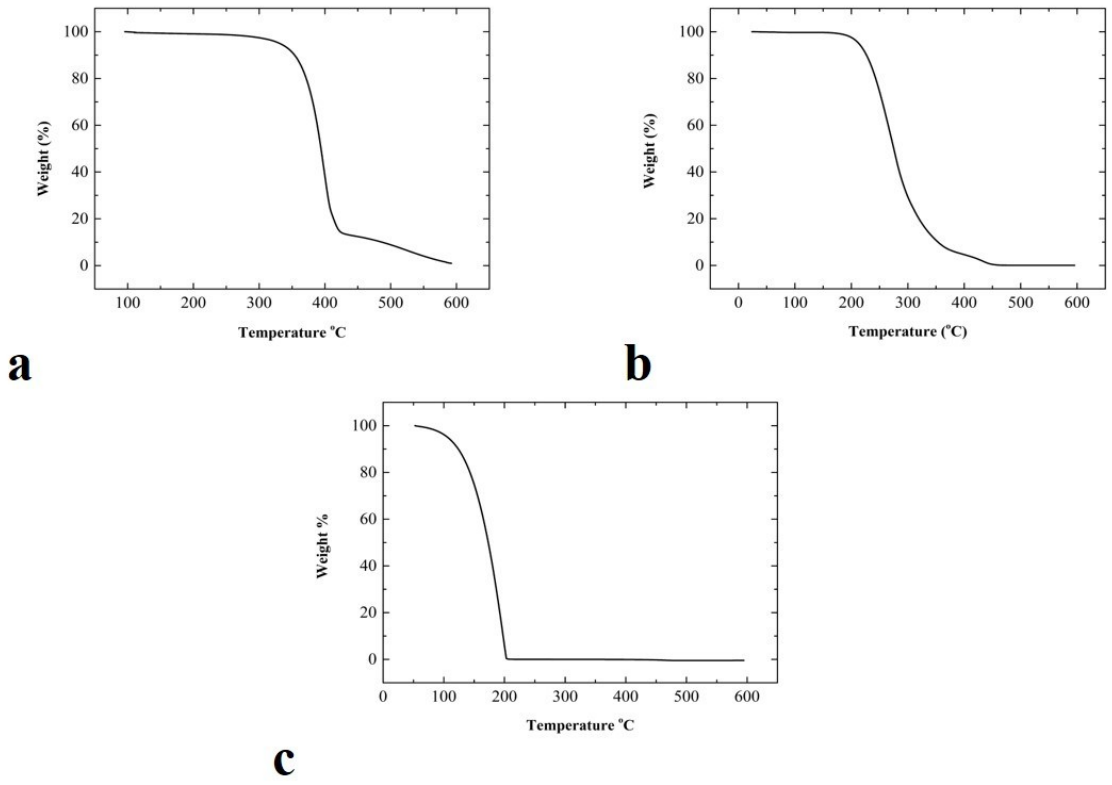


Fig. S4 TGA characterization of the anti-icing agents used showing the weight loss as a function of temperature: a) PEOX-5K, b) PEG-2K, c) EG.

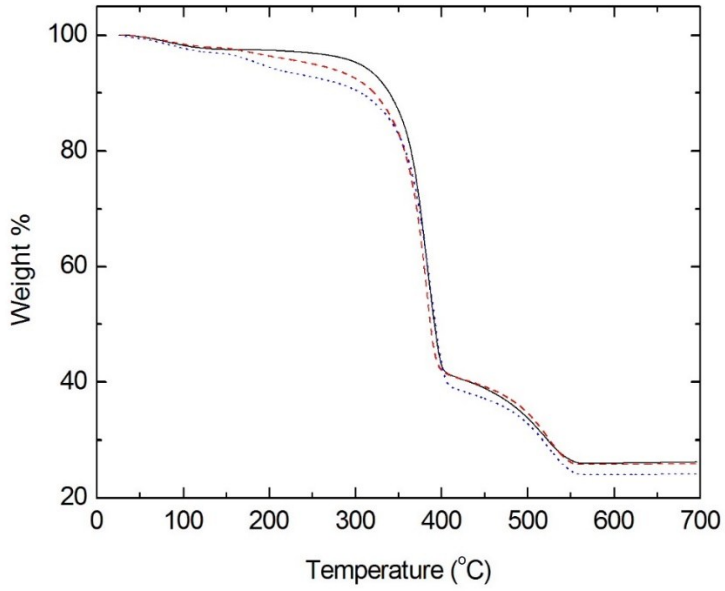


Fig. S5 TGA characterization of the anti-icing agent filled DE/SBS composites showing the weight loss as a function of temperature: DE/SBS filled in 10 v% PEG-600 (solid line), DE/SBS filled in 30 v% PEG-600 (dashed line), DE/SBS filled in 50 v% PEG-600 (dotted line).

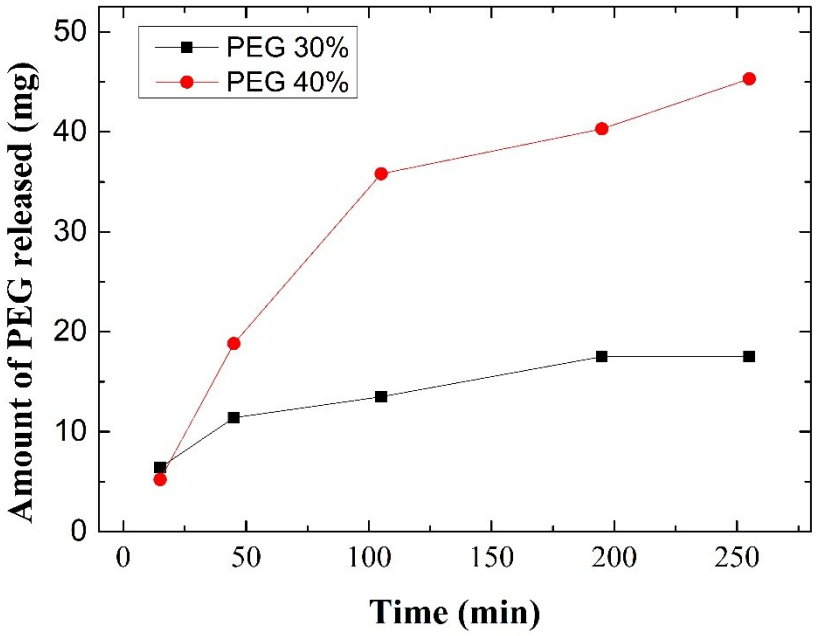


Fig. S6 Mass (in mg) of PEG-600 released from filled DE/SBS composites into 10 mL water as a function of time. The amount released was determined gravimetrically. DE/SBS composites filled in 30 volume % EG in binary mixture (squares); DE/SBS composites filled in 40 volume % EG in binary mixture (circles).

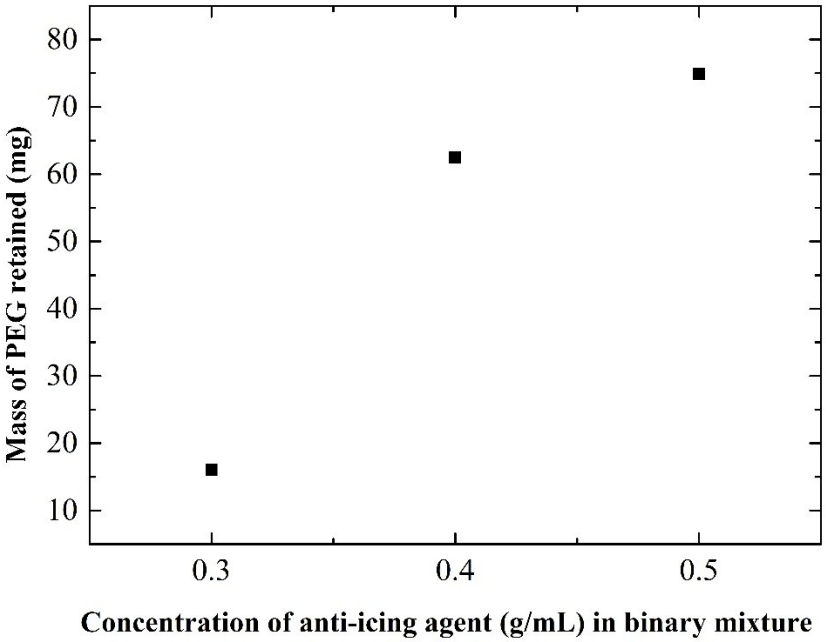


Fig. S7 Mass (in mg) of PEG-10K retained in DE/SBS composites filled in different concentrations of PEG-10K solutions in binary mixture of diethyl ether and acetone.