Supplementary materials

Compound	Name Molecular weight [g/mol]	Structure
C8T	Octyltrimethylammonium theophyllinate MW: 351.49	$H_{3}C - \bigvee_{CH_{3}}^{CH_{3}} CH_{2} - \bigcap_{7}^{H_{3}C} CH_{3} - \bigvee_{H_{3}C} \bigvee_{N}^{N} $
C10T	Decyltrimethylammonium theophyllinate MW: 379.54	$H_{3}C \xrightarrow{CH_{3}}_{CH_{3}}CH_{2} \xrightarrow{G}_{9} \xrightarrow{G}_{0} \xrightarrow{N}_{CH_{3}} \xrightarrow{N}_{CH_{3}}$
C12T	Dodecyltrimethylammonium theophyllinate MW: 407.59	$H_{3}C - \underbrace{\overset{CH_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}C}{\underset{H_{3}}{\overset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{1}}{\underset{H_{1}}$
C14T	Tetradecyltrimethylammonium theophyllinate MW: 435.65	$H_{3}C \xrightarrow[CH_{3}]{} H_{3}C \xrightarrow[CH$
C16T	Hexadecyltrimethylammonium theophyllinate MW: 463.70	$H_{3}C \xrightarrow{CH_{3}}_{CH_{3}}CH_{2} \xrightarrow{H_{3}C}_{15} \xrightarrow{N}_{0} \xrightarrow{N}_{N}$
C18T	Octadecyltrimethylammonium theophyllinate MW: 491.75	$H_{3}C - \underbrace{\overset{CH_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}}{\underset{H_{3}}{\overset{H_{3}C}{\underset{H_{3}}{\overset{H_{3}C}{\underset{H_{3}}{\overset{H_{3}C}{\underset{H_{3}}{\overset{H_{3}C}{\underset{N}{\overset{H_{3}C}{\underset{N}{\overset{N}{\underset{H_{3}}{\underset{H_{3}}{\overset{N}{\underset{N}{\underset{H_{3}}{\overset{N}{\underset{H_{3}}{\underset{N}{\underset{H_{3}}{\underset{N}{\underset{N}{\underset{N}}{\overset{N}{\underset{N}{\underset{N}{\underset{N}{N}}{\overset{N}{\underset{N}{\underset$
C6Im	1-hexyl-3-methylimidazolium chloride MW: 202.72	
C8Im	1-methyl-3-octylimidazolium chloride MW: 230.78	H_3C N^+ N^-CH_3
C10Im	1-decyl-3-methylimidazolium chloride MW: 258.83	$H_3C_N^+$ CH_3
DC10Im	1,3-didecyl-2-methylimidazolium chloride MW: 399.10	

Table S1. The theophylline-based ILs and imidazolium-based ILs used in the studies.

Table S2. BET and PZC analyses of studied nanoparticles

	MgO nanoparticles	SiO ₂ nanoparticles
BET Surface Area	$46.6530 \pm 0.3040 \ m^2 \ g^{\text{-1}}$	$154.8858 \pm 1.5541 \text{ m}^2 \text{ g}^{-1}$
Correlation Coefficient	0.9998729	0.9998509
t-Plot Micropore Area	6.4513 m ² g ⁻¹	63.0977 m ² g ⁻¹
t-Plot External Surface Area	40.2017 m ² g ⁻¹	91.7880 m ² g ⁻¹
Point of Zero Charge	11.5	3.5