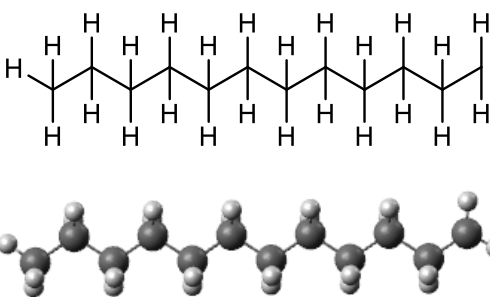
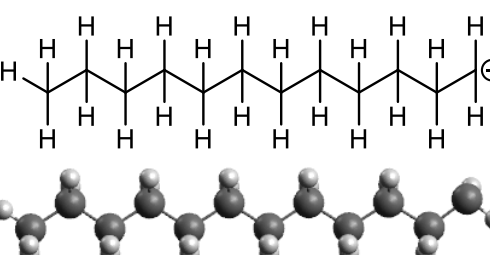
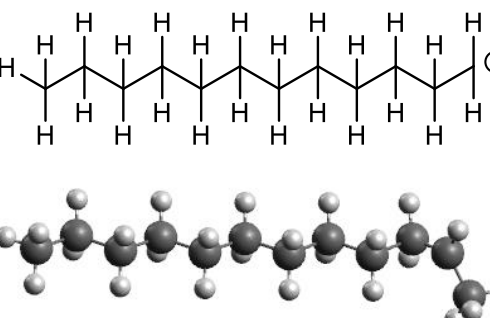
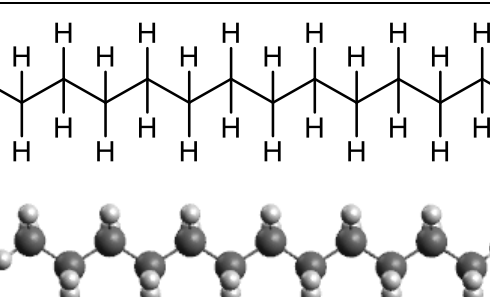
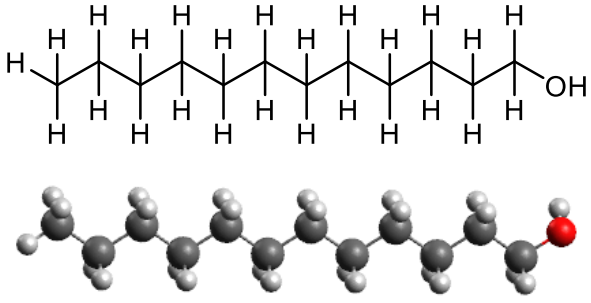
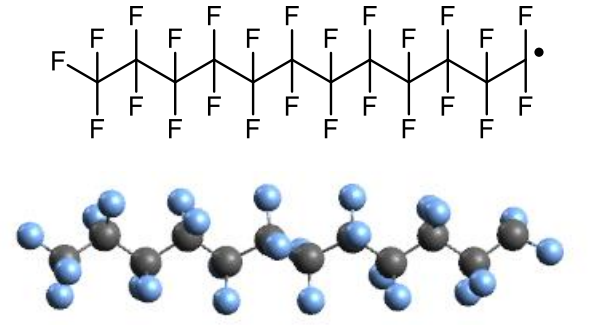
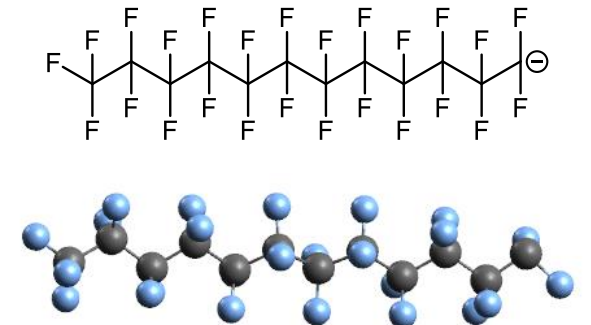
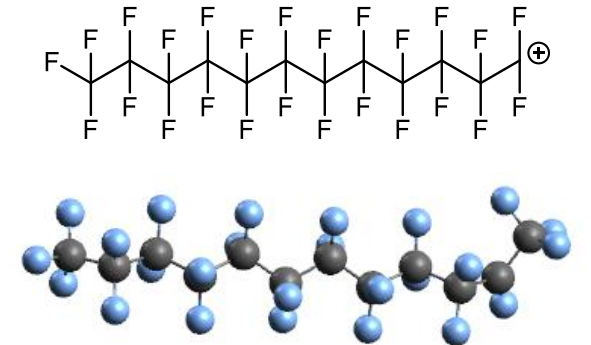
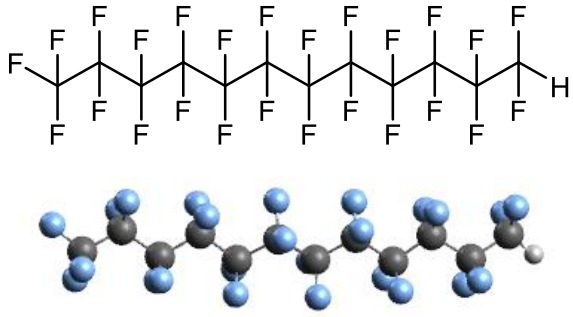
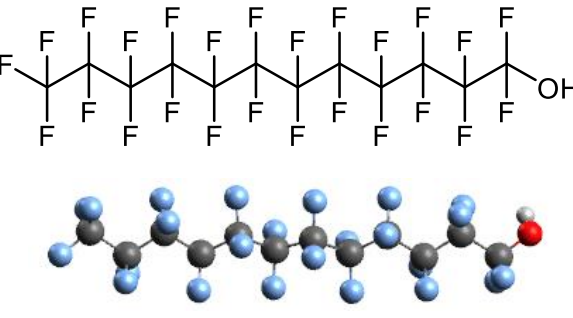
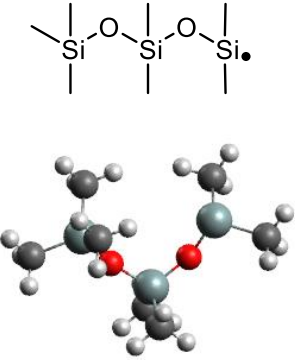
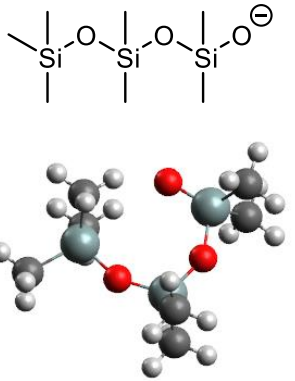


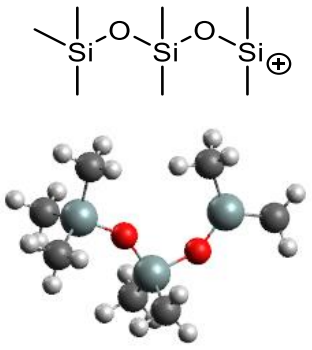
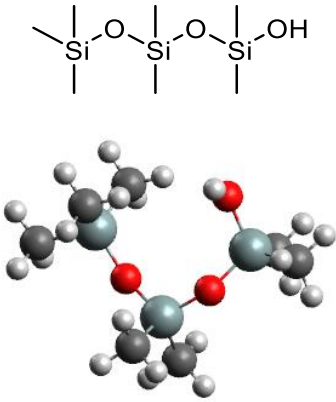
Supplemental Information

SI 1. Chemical structure and the DFT energies of fragments.




Fragment Name	Input Chemical Structure	UB3LYP/6-31G(d,p) Energy (eV)
	Optimized Geometry	
Polyethylene Mechano-radical		-12852.8
Polyethylene Mechano-anion		-12851.7
Polyethylene Mechano-cation		-12846.2
Polyethylene Protonated Mechano-anion		-12871.1


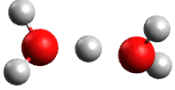
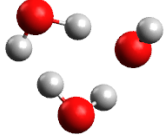
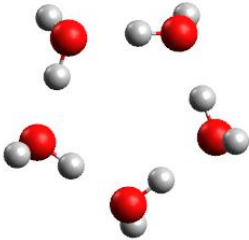
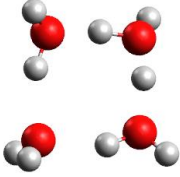
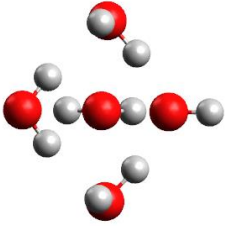
<p>Polyethylene Hydroxylated Mechano-cation</p>		<p>-14917.6</p>
<p>Polytetrafluoroethylene Mechano-radical</p>		<p>-80358.8</p>
<p>Polytetrafluoroethylene Mechano-anion</p>		<p>-80360.0</p>
<p>Polytetrafluoroethylene Mechano-cation</p>		<p>-80349.8</p>

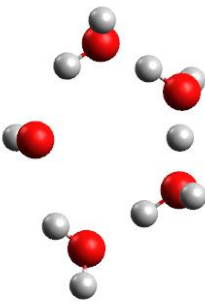
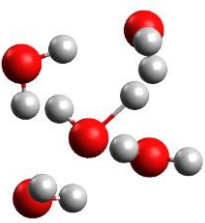
<p>Polytetrafluoroethylene Protonated Mechano-anion</p>		<p>-80377.0</p>
<p>Polytetrafluoroethylene Hydroxylated Mechano-cation</p>		<p>-82424.2</p>
<p>Polydimethylsiloxane Si-terminated Mechano-radical</p>		<p>-35336.3</p>
<p>Polydimethylsiloxane O-terminated Mechano-anion</p>		<p>-37386.8</p>

<p>Polydimethylsiloxane Si-terminated Mechano-cation</p>		<p>-35330.7</p>
<p>Polydimethylsiloxane Protonated Mechano-anion same as Hydroxylated Mechano-cation</p>		<p>-37402.6</p>

SI 2. Chemical Structure and DFT energies of water clusters and ions.

Water Chemical Structure	Optimized Geometry	UB3LYP/6-31G(d,p) Energy (eV)
[H ₂ O] ₁		-2079.5
H ⁺		0
OH ⁻		-2060.6

$[\text{H}_2\text{O}]_3$		-6239.3
$[\text{H}_2\text{O}]_2\text{H}^+$		-4168.6
$[\text{H}_2\text{O}]_2\text{OH}^-$		-6223.0
$[\text{H}_2\text{O}]_5$		-10399.8
$[\text{H}_2\text{O}]_4\text{H}^+$		-8329.7
$[\text{H}_2\text{O}]_4\text{OH}^-$		-10384.3

$[\text{H}_2\text{O}]_5^+$		-10390.7
$[\text{H}_2\text{O}]_5^-$		-10397.7