Periodic Graphics
With Compound Interest

DEICERS & ANTIFREEZE

Deicers “interfere” with water molecules, making it more difficult for H₂O to aggregate and freeze. In this way, they lower the freezing point of water. Each of these chemicals has what is known as a “eutectic point”: the lowest temperature to which they can depress the freezing point of water. This occurs at a particular deicer concentration.

**KEY**

**Formula**

**Chemical Name**

**Percent weight in solution & eutectic point**

- Primary use: deicing chemical
- Primary use: antifreeze chemical

**ROAD DEICERS**

Crews traditionally deice roads with sodium chloride because it is inexpensive. But its tendency to cause corrosion has led to other compounds, such as calcium chloride and magnesium chloride, being used.

**AIRPLANE DEICERS**

Because chloride salts can be corrosive, their use is prohibited on aircraft. Instead, a range of glycols, as well as other nonchloride salts, commonly protect planes. They are also applied to runways.

**ANTIFREEZE CHEMICALS**

As salts can cause corrosion of metal parts on machinery and in vehicles, glycols are instead used in antifreeze. Ethylene glycol has been in use for longer, but it’s toxic to humans and animals; propylene glycol is effectively nontoxic.

Periodic Graphics is a collaboration between C&EN and Andy Brunning, chemistry educator and author of the popular graphics blog Compound Interest. To see more of Brunning’s work, go to compoundchem.com.