Deicer lab essay

AbstractThrough experimentation looking at freezing point depression and heat of dissolution, potassium chloride’s effect as a deicer was measured. In solutions, KCl lowered the freezing point of water below zero degrees Celsius, and was seen to increase in magnitude as the concentration increased.

The enthalpy of the dissolution was found to be endothermic, meaning it absorbs heat from the surrounding system. Other aspects of KCl as a deicer were also researched, including its environmental impact and cost per unit. It was found to have some impact on the plant life close to the roads and on the heavy metals found in soil that can be found in drinking water. The cost of KCl is approximately 500 dollars per metric ton, which is expensive compared to other chemically effective deicers. IntroductionMinnesota and many other areas in the world face the dangers of icy roads every winter.

Governments are responsible for removing snow and ice from roads for the public’s safety, which is commonly done by clearing snow by snowplows, applying sand for traction, and salt. A variety of salts are used to lower the freezing point, which occurs when a solute is added to a liquid1. Pure water has a freezing point of zero degrees Celsius, but this can be lowered by the addition of certain solutes. At the freezing point, molecules pass between the solid and liquid phase at equal rates, the addition of another type of molecule disrupts this equilibrium, and the solid will begin to melt2. The freezing point of an aqueous salt solution is determined by the concentration of the dissolved solution and the number of ions in the formula unit1.

Having a more concentrated solution increases the magnitude of the temperature change, as does the number of ions separated. The effectiveness of a salt’s deicing ability is also determined by its enthalpy1. If it exothermically dissolves then heat is released into the surrounding ice, thus resulting in larger amounts of ice melting per…