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| **SAND**  Sand is sometimes used on roads at risk of freezing because it can both increase traction of tires by providing a rougher surface. However, sand actually inhibits the process of deicing by salt or other deicing chemicals (Salt Institute).  **SALT**  Salt is an ideal deicing agent for many reasons. Most importantly it effectively reduces the freezing point of water, which will prevent ice from forming. This is because when the salt is dissolved into the water, it chemically bonds to the H2O molecules. . This bond requires more energy loss to form into ice crystals. (Oregon State University). As salt scattered onto roads melts the surface ice, it forms "brine," or a strong saline solution (Salt Institute). This brine then sinks down into cracks in the ice and snow and the high salt concentration prevents water from freezing and bonding to the pavement. This, in effect, will break up the ice and snow on roads quickly and prevent more from forming as long as ample salt is present. Salt also reduces work required to return roads to safe conditions.  Furthermore, salt significantly reduces manpower needed to maintain safe roads. If deicing agents weren�t available, roads would need to be cleared manually very frequently. The snowplows used to clear the ice would wear the roads out quickly, raising costs, in addition to creating traffic problems.  Many alternatives to salt have been found have major drawbacks. Salt is also ideal because it is safer to handle than alternatives. Salt is relatively benign to humans, as it is even an essential part of our diet. Alternatives can be dangerous to human road workers to implement. They can also have more drastic effects on the environment. Some are also significantly more expensive and damaging to roadways or nearby structures.  **SALT IMPURITIES**  Salt from different regions generally have different impurities. We used California solar salt, which is one of the most pure and free from additives. Solar salt is created from being dried in a kiln, ensuring purity through evaporation. The chemical makeup of California solar salt, according to Martina Moran of the Salt Institute, is:  **99.75% NaCl (dry basis)**  **Impurities:**  **0.01% water insoluble**  **0.17% CaSO4**  **0.018%MgSO4**  **0.013% MgCl2**  **0.03% Sodium Sulfate**  We do not believe that these low levels of impurities would significantly affect our data as we kept the type and brand of salt consistent throughout the experiment. However, the salts with more impurities are used in various other regions of America. One such example is Kansas rock salt, which consists of:  **95.8-97.4% NaCl (dry basis**  **Impurities:**  **0.015% iron oxide**  **2.2-3.5% CaSO4 (much of which is insoluble)**  **0.004-0.09% MgSO4**  **.20-0.26% MgCl2**  Another type of salt commonly used for deicing roads is gulf coast rock salt, which consists of:  **99.01-99.26% NaCl (dry basis)**  **Impurities:**  **0.54-0.75% water insoluble**  **0.17-0.24% CaSO4**  **.004-.012% CaCl2**  **.002-0.011% MgCl2**  Although these impurities remain throughout the rock salt, they play very little impact on our experiment, as their numbers are so insignificant.  ([NEXT](http://docs.google.com/intro3.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |