

Should You Put Pickle Juice On The Road? Innovations With Deicer Chemicals.

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Recycle Product Questions

- What is the origin of the material?
- What facts can you put together regarding the material?
- What information can the supplier provide about the material. Specifics on the chemical or biological aspects.
- Why do you, or a producer, want you to use the material?
 - Is there great potential for this to work?
 - Will the material need processing to make it useable which could add to the cost?
 - Will it save you money or cost you money?
 - Is it a break even on the money but a great way to recycle a product?

What Should You Know

- Examine all the pros and cons of the product.
 - Will the material melt ice by itself? (Try it in a freezer)
 - Will the material aid a salt product to have a more effective working temperature, or stay on the road longer?
 - At what temperature will the material freeze?
 - Will it help your product lower its freeze point or will it make the freeze point higher?
 - Very important if you are going to store any volume of the material, or help in the mixing of the material.
 - Will the material be consistent in its chemical make up for the duration of the season?
 - Or will the product vary from batch to batch on the key components that add value to you using it?

What Should You Know

- Cost benefit analysis
 - Cost of material
 - Cost of transportation
 - Special mixing requirements or equipment
 - Ease of getting and supplying the material
 - Will you have to create separate storage
 - Will extend the life of the material on the roadway
- Benefit to the supplier as they do not have to pay for disposal of the material?
- What are the impacts to the environment?
- What are the impacts to the highway infrastructure?
 - Corrosion potentials? Damage to Pavements?

Mixing and Storage

- Have you made a mix of the material and subjected it to a cold temperatures in a freezer to see what it will do?
 - Suggest that you make a mixture at the ratios you plan to use. Put the mixture into a plastic bottle and place in a freezer set to zero degrees F. Check it every day for a week. What is the condition of the material every day when you check on it? Is it liquid, solid, slush, made a precipitate.
 - Remember that even a 1% volume of solids can translate into tons of material that you cannot not use and may have to clean up.
 - Will the material pass through your filters? (No. 10 sieve size)

Storage Test Results



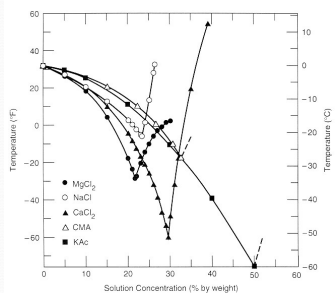
Sieve Test



What Is Concentration

- Concentration is the measure of a specific amount of a chemical element, compound, or substance in a material.
 - Salt Brine has an optimum concentration of 23.3% where the freeze point is approximately minus 6 degrees F.
 - 10,000 parts per million equals 1%
 - 23.3% NaCl equals 233,000 parts per million. (mg/L)
- Question- If I have a liquid product that has 20,000 ppm of salt in it, is this a good choice to put into the deicer product? (Just based on the salt concentration.)

Eutectic Temperature Curves (FHWA-RD-95-202)



What Should You Know

- What is the pH level of the material?
 - The pH will tell you if it is acidic or caustic in nature.
 - pH range is 0 - 14
 - Lower pH values are acidic, 7 is neutral (Salt), higher pH values are basic. (fruit juices, coffee, vinegar, and milk are all acidic substances, while ammonia, baking soda, and lime are basic substances.
 - Acceptable ranges are between 6-9.
 - Brine products have a tremendous amount of dissolve solids. Quick way to determine pH is to use the Pacific Northwest Snowfighters method. Mix 1 part deicer to 4 parts water. Let it set for 30 minutes and then take the pH.
- Do your roads have limestone in them? Concrete?

What Should You Know

- Does the current supplier of the material have to pay a waster water treatment plant to process the waste?
- What does their material disposal profile look like?
 - Is it high in fats, proteins, or carbohydrates?
 - What are the Oxygen Demands, BOD and COD.
 - Does it have an odor?
 - Is the material acidic, neutral, or basic?
 - Is it high in nitrogen, phosphates, or ammonia?
 - Is it high in trace metals such as Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, or Zinc. These metals are regulated by the EPA.

What You Need to Know

- Will the material help in getting to a friction factor on the road or will it make the road slippery.
- Need to always think about the environmental effects on soil, vegetation, surface water, groundwater, aquatic species, and air quality, etc.
- Don't forget about your application equipment.
 - Will you have to make special changes on your equipment

So What About That Pickle Juice

- It has salt brine, vinegar, seasoning, and preservatives.
- What is the concentration of that salt brine?
- What about the pH of that vinegar?
- Use it straight or mix it with salt brine?
- What about the pH of the mixture of salt brine and pickle juice?
- Weak organic acids can have a negative impact on concretes, limestone, galvanized or aluminum metal, bridges, highway signs and other items in the highway infrastructure.
- What about the odor? Is it strong enough for complaints, act as an animal attractant, will it track into businesses if use in a urban environment?

So What About That Pickle Juice

- What are some potential environmental impacts?
 - Lower pH allows more trace metals to go into solution
 - pH is a very important factor to aquatic species
 - Can the pH be raised to make the product more viable with a low cost effort thus reducing the acidic impact?
- Will it make the finish product more effective to use?
- What are all the cost associated to the use of it and will it be a benefit to the customers?

Information Resources

- Pacific Northwest Snowfighters (PNS)
 - Has product specifications for a variety of deicers
 - Experimental Category for new product development
 - Lab Photos
 - Encourage suppliers to qualify their material with the PNS
 - Website: <http://pnsassociation.org/>
- Clear Roads
 - Research regarding chemical products
 - Research regarding all types of winter maintenance activities.
 - Website: <http://clearroads.org/>

Contact Information

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