



Parachute Science 2025

Squeaky Clean Science: DIY Dishwasher Pellets

Overview:

Creating your own DIY dishwasher pellets is not just cost-effective but also a fantastic way to explore basic chemistry and sustainable cleaning!

Supplies & Equipment Needed:

- 1 Cup Baking Soda – Helps break down grease and neutralize odors.
- 1 Cup Washing Soda – Enhances cleaning power by softening water.
- 1/4 Cup White Vinegar – A natural acid to break down grime.
- 1/4 Cup Epsom Salt – Helps prevent water spots on dishes.
- 1/2 Cup Citric Acid – Boosts cleaning power and fizzing reaction.
- 5 Drops Tea Tree Essential Oil – Antibacterial and antifungal properties.
- 5 Drops Lemon Essential Oil – Natural degreaser and fresh scent.
- 5 Drops Eucalyptus Essential Oil – Anti-microbial and fresh scent.
- Mixing Bowl
- Spoon or Whisk
- Silicone Mold (Small-sized for dishwashers)
- Air-tight Storage Container

Step-by-Step Instructions:

Step 1: Prepare Dry Ingredients

1. In a mixing bowl, combine **baking soda, washing soda, Epsom salt, and citric acid**.
2. Stir well to ensure an even mixture.

Step 2: Add Essential Oils

3. Add **tea tree, lemon, and eucalyptus essential oils** to the dry mix.
4. Stir again to distribute the oils evenly.



Parachute Science 2025

Step 3: Activate with Vinegar

5. Slowly pour in white vinegar, stirring continuously to control fizzing.
6. Mix thoroughly until the consistency is like slightly damp sand. If too wet, add a little more baking soda.

Step 4: Mold the Pellets

7. Firmly pack the mixture into silicone molds, ensuring a snug fit.
8. Be mindful of mold size so that the pellets fit in your dishwasher's detergent compartment.

Step 5: Dry & Store

9. Let the pellets dry for 24-48 hours in a dry location.
10. Once hardened, remove from molds and store in an air-tight container to prevent moisture absorption.

Taking It to the Next Level – Experiment Variables

Want to explore more? Try these variations:

Adjust the Ratio of Ingredients

- Does increasing citric acid make the pellets fizz more?
- Does adding more washing soda improve cleaning power?

Test Different Essential Oils

- Try using lavender, peppermint, or orange oil for different scents and antibacterial properties.

Experiment with Drying Time

- Does a longer drying time make the pellets harder and last longer?

Compare Dishwasher Results

- Test different dishwasher settings (normal vs. heavy-duty) and compare cleaning efficiency.



Parachute Science 2025

The Science Behind the Experiment

This experiment showcases acid-base reactions and water softening chemistry:

1. Chemical Reaction & Fizzing

- Citric acid (acid) + Baking soda (base) + Vinegar (acid) → CO₂ gas + cleaning power.
- The reaction helps break down grime while releasing carbon dioxide gas.

2. Water Softening & Grease Removal

- Washing soda softens hard water, allowing detergents to work better.
- Essential oils offer antimicrobial properties while adding freshness.

3. Natural Surfactants & Spot Prevention

- Epsom salt prevents residue buildup on dishes, leaving them spotless.
- The final hardened structure dissolves efficiently in the dishwasher cycle.

Additional Reading & Information

Explore the science behind cleaning chemistry with these reputable sources:

- **American Cleaning Institute:** <https://www.cleaninginstitute.org/understanding-products/science-soap/how-cleaning-works> – Learn about surfactants, water softeners, and how dishwashing detergents break down grease.
- **National Science Teaching Association:** <https://www.nsta.org/ncss-case-study/sponges-and-bubbles> – Understand the pH balance and chemical interactions that make vinegar and baking soda react.
- **EPA Green Cleaning Guide:** <https://www.epa.gov/iaq-schools/forms/webinar-green-cleaning-improved-health-return-investment-green-cleaning-schools> – Discover the benefits of non-toxic cleaning agents and their impact on the environment.

Ready to give it a try? Share your results and tag us with your experiments!  