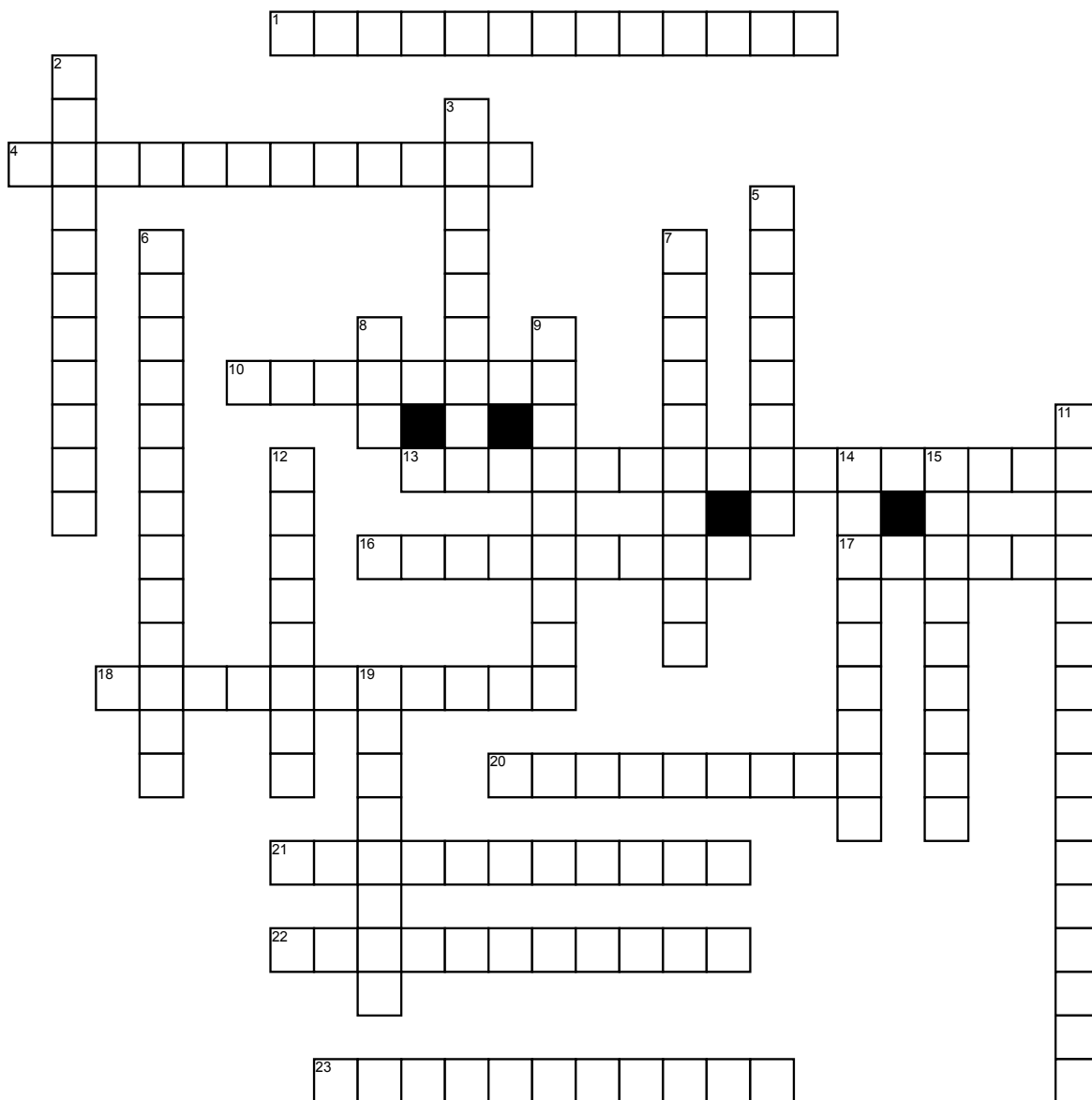


Name: \_\_\_\_\_

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# A Word Quest with Plastics and Polymers



## Across

1. Polyethylene is an example of this type of plastic that can be remolded.

4. The formal name for a step-growth polymerization reaction.

10. Phenol and formaldehyde react under heat and pressure to produce this plastic. Hint: it was the first plastic made entirely of synthetic components.

13. "Vinegar Syndrome" is a telling sign of the decomposition of this material also used to coat photographs starting in the 1920s.

16. Used to improve specific properties of plastics such as flexibility or colour, while maintaining other properties. These may migrate as the plastic ages.

17. The name of the molecule composed of one benzene ring with one less hydrogen that is always attached to something else.

18. A step in addition polymerization whereby two free radicals join to create a stable bond.

20. The term that describes two equal forms of a benzene molecule when single and double bonds alternate around the ring (bond length is 1.5).

21. The name for a type of copolymer whereby monomers are arranged in turns. This is needed for crystalline polymer forms.

22. The term to describe the chemical bonds that form between Polyvinyl acetate chains in Borax to produce silly putty.

23. The name for a molecule, atom or ion with unpaired electrons that initiates addition polymerization.

## Down

2. The second step in addition polymerization whereby the chain grows (the most amount of time is spent here).

3. Composed of amide monomers represented as  $\text{HNC=O}$ . Hint: Nylon 6 is an example of this polymer.

5. A type of polymer described as "beads on a string with charms".

6. Plastic used for ketchup bottles and yogurt or margarine containers. It is identified by the Recycling Number "5".

7. The name for amorphous polymers with low glass transition temperatures ( $T_g$ ).

8. A type of plastic with holes between its cross-linked chains. This plastic can swell and absorb water or solvent.

9. A type of test (qualitative analysis) whereby plastic samples are exposed to an open flame. Hint: A green flame indicates the presence of PVC.

11. A highly flammable material used as a transparent coating on photographs from 1889-early 1950s. One positive test to distinguish it from other materials is that it turns a deep blue colour in a solution of Diphenylamine with 90% Sulfuric Acid.

12. A residue that forms on the surface of plastics which is often oily.

14. A type of polymer with chains of two or more monomers.

15. Epoxies are an example of this type of plastic that decomposes before it melts. They are re-used as fillers.

19. The formal name for a chain reaction polymerization.