

Polymers

Polymers

- * A polymer is a very large molecule that is made by linking together many smaller units called monomers.
- * Example: Polyester, Nylon, Plastics, DNA, RNA

- * Polymers that can be heated and moulded into specific shapes are called plastics.
- * All plastics are synthetic.
- * Example: Polyethene, Rubber, Gum, Styrofoam

*** Natural polymers are found in living things.**

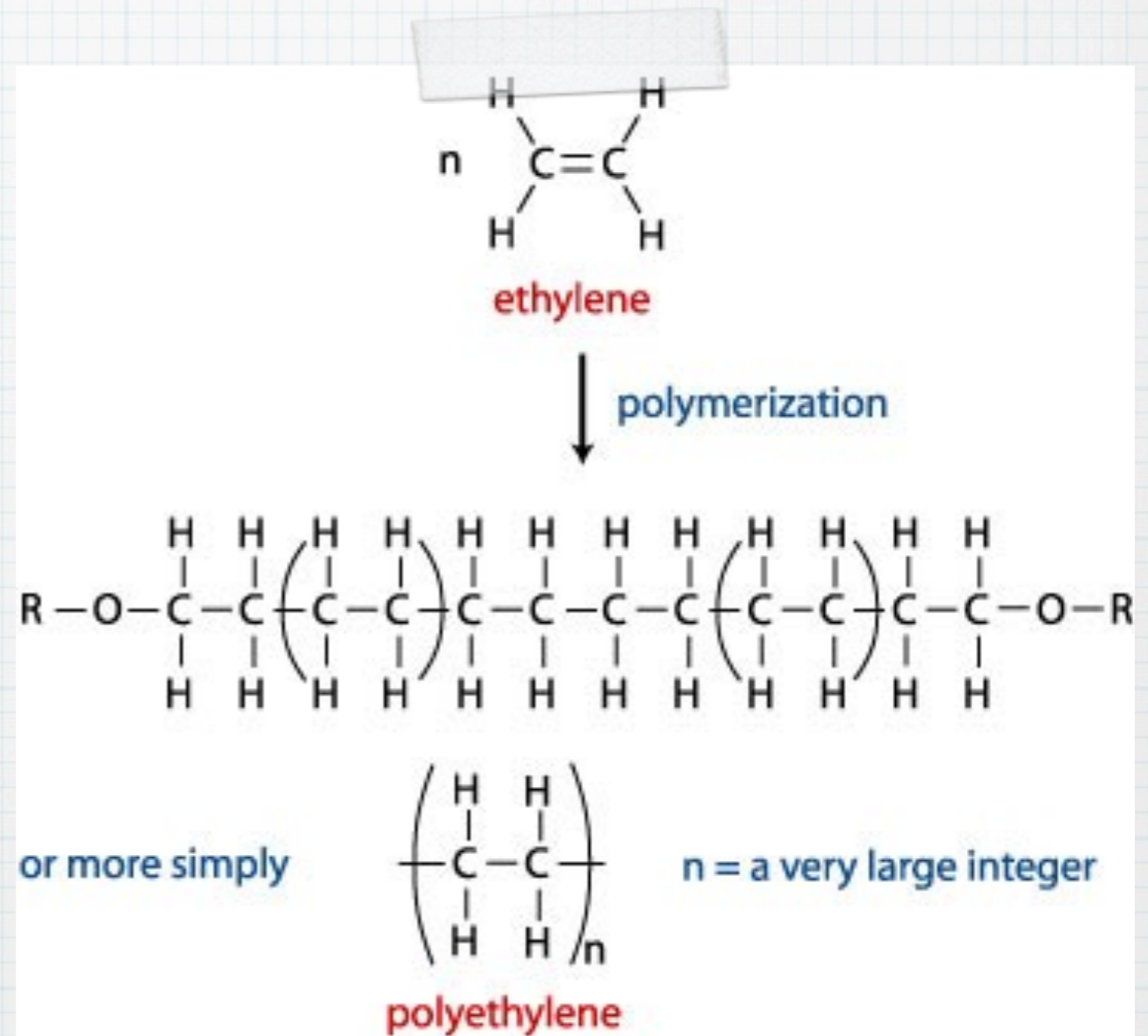
*** Example: Starch**

Synthetic Polymers

- * Synthetic polymers are formed by two different types of reactions:
 - * Addition Polymerization
 - * Condensation Polymerization

Addition Polymerization

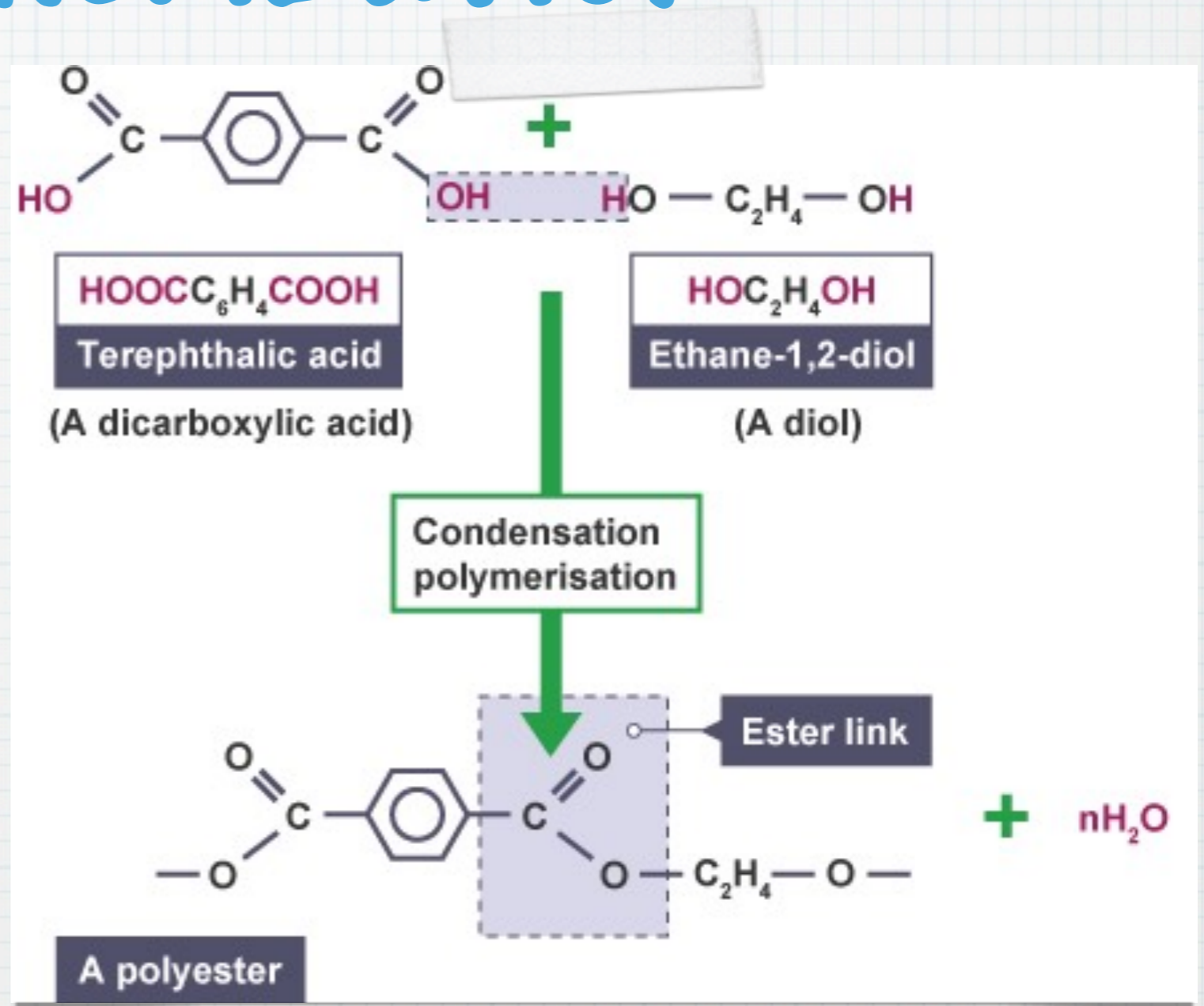
- * Reaction between monomers with multiple bonds that are joined together by multiple addition reactions.
- * The monomers in an addition polymer are identical.



Condensation Polymerization

* Two different monomers are combined. Each may have the same or a different functional group.

* Example: Polyester



Real Life Polymers

- * Place a new and unused disposable diaper on the piece of paper. Carefully cut through the inside lining and remove all the cotton-like material. Put all the stuffing material into a clean, zipper-lock bag.
- * Scoop up any of the polymer powder that may have spilled onto the paper and pour it into the bag with the stuffing. Blow a little air into the bag to make it puff up like a pillow, then seal the bag.
- * Shake the bag for a few minutes to separate the powdery polymer from the stuffing. Notice how much (or how little) powder falls to the bottom of the bag.
- * Carefully remove the stuffing from the bag and pour the dry polymer you just extracted from the diaper into a small, clear cup.
- * Fill the cup with about 4 ounces (120 mL) of water. Mix it with your finger until the mixture begins to thicken.
- * Observe the gel that the polymer and water create. Turn the cup upside down and see how it has solidified.
- * Add salt to the gel to see how it impacts the absorbency of the polymer.

Diaper Debrief

- * polyacrylate: can absorb over 800 times its weight in water

