When trying to classify a process as exothermic or endothermic, watch how the temperature of the surroundings changes. An exothermic process releases heat, and causes the temperature of the immediate surroundings to rise. An endothermic process absorbs heat and cools the surroundings. Can you think of a way to test the classification of each of these processes?

Magnesium + O_2 → Magnesium Oxide

Exothermic

$Mg + O_2 \rightarrow MgO$ + heat

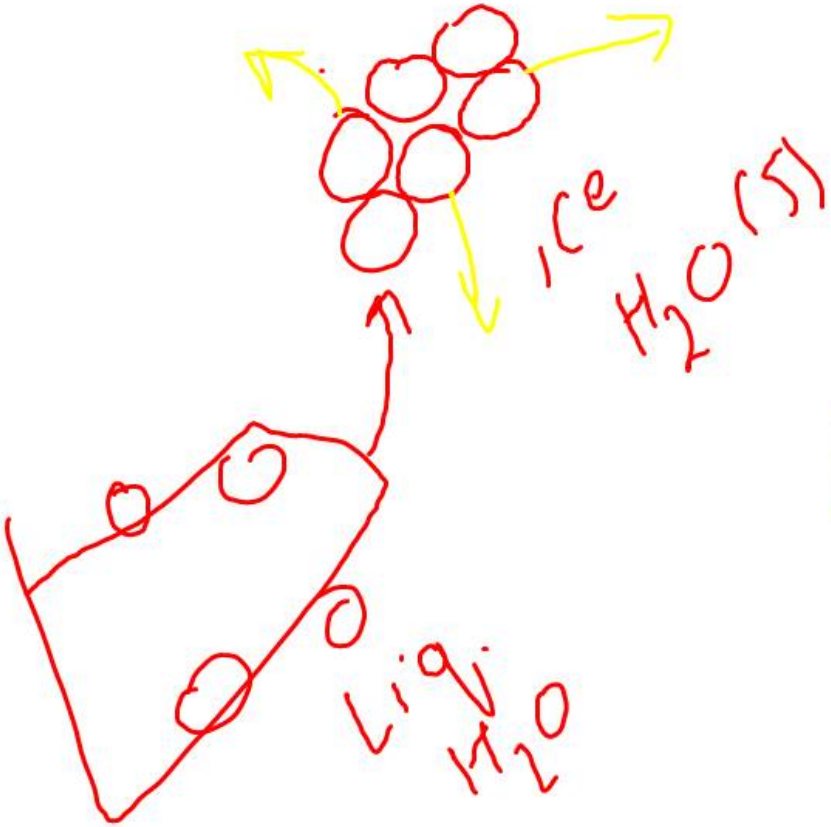
2 → 1 + heat

ΔH - Enthalpy = -ve

D

B

Exothermic processes	Endothermic processes
making ice cubes	melting ice cubes
formation of snow in clouds	conversion of frost to water vapor
condensation of rain from water vapor	evaporation of water
a candle flame	forming a cation from an atom in the gas phase
mixing sodium sulfite and bleach	baking bread
rusting iron	cooking an egg
burning sugar	producing sugar by photosynthesis
forming ion pairs	separating ion pairs
Combining atoms to make a molecule in the gas phase	splitting a gas molecule apart
mixing water and strong acids	mixing water and ammonium nitrate

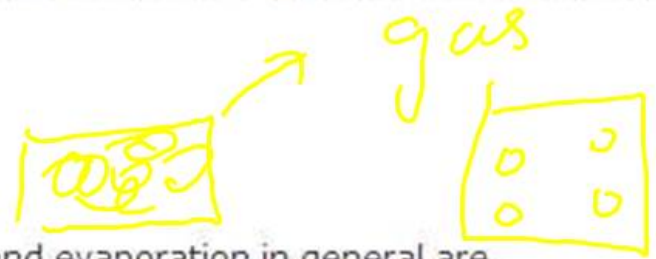


$$H_2O(\ell) \rightarrow H_2O(s)$$

An endothermic reaction is any chemical reaction that absorbs heat from its environment. Here's a list of examples of endothermic reactions. You can use these when asked to cite an example or to get ideas to set up a demonstration of an endothermic reaction or process.

Endothermic Processes

These examples could be written as chemical reactions, but are more generally considered to be endothermic or heat-absorbing processes:



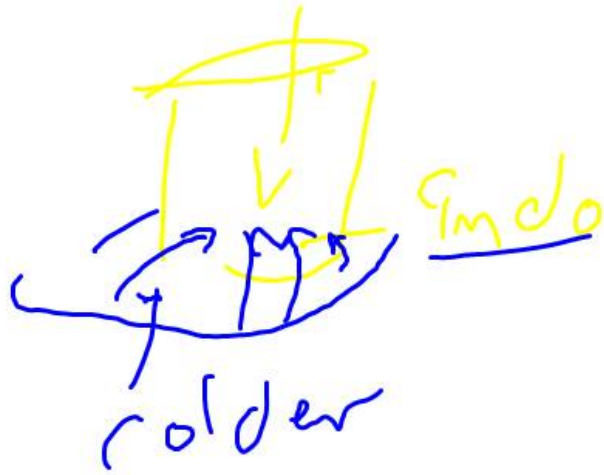
- melting ice cubes
- melting solid salts
- evaporating liquid water
- converting frost to water vapor (melting, boiling, and evaporation in general are endothermic processes)
- making an anhydrous salt from a hydrate
- forming a cation from an atom in the gas phase
- splitting a gas molecule
- separating ion pairs
- cooking an egg
- baking bread

Endothermic Chemical Reactions

- reaction of barium hydroxide octahydrate crystals with dry ammonium chloride
- dissolving ammonium chloride in water
- reaction of thionyl chloride ($SOCl_2$) with cobalt(II) sulfate heptahydrate

- mixing water and ammonium nitrate
- mixing water with potassium chloride
- reacting ethanoic acid with sodium carbonate
- photosynthesis (chlorophyll is used to react carbon dioxide plus water plus energy to make glucose and oxygen)

B



B

Exothermic:

Coming together releases

energy thus, Exothermic

Endothermic:

Coming apart absorbs energy thus,