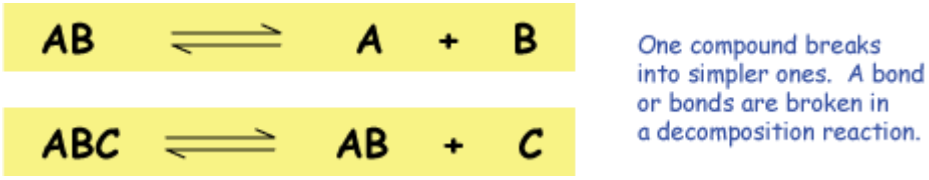
DECOMPOSITION REACTIONS AND SINGLE DISPLACEMENT REACTIONS

Decomposition reactions are really just the opposite of synthesis. Something more complicated "falls apart" into less complicated things. Decomposition is usually what we're talking about when we speak of "shelf life", like for drugs or some foods. Decomposition that is catalyzed by visible or ultraviolet light is why many drugs come in brown plastic bottles (the brown color blocks a lot of visible light and plastics absorb most UV).

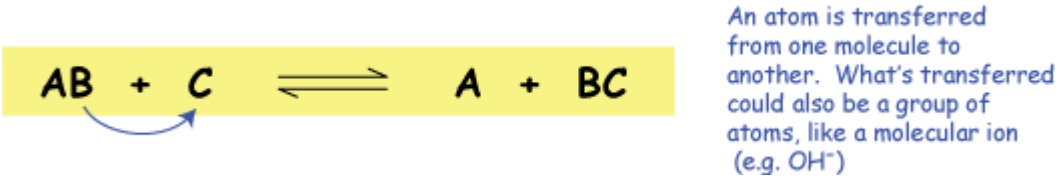


Examples of decomposition reactions

$AgO_{2\,(aq)} \rightleftharpoons Ag_{(s)} + O_{2(g)}$	Aqueous silver oxide decomposes into solid silver metal and oxygen gas.
$H_2SO_{4(aq)} \rightleftharpoons 2H^{+}_{(aq)} + SO_4^{2-}{}_{(aq)}$	Sulfuric acid dissociates into two protons plus a sulfate ion.
$H_2O_{2\,(aq)} \rightleftharpoons H_{2(g)} + O_{2(g)}$	Aqueous hydrogen peroxide decomposes into hydrogen and oxygen gas.

Single displacement reactions

Displacement reactions might also be called **substitution** reactions. In a displacement reaction, one chemical moiety (*moiety* is a general name for an atom or a functional group like OH or NH_4) from one reactant takes the place of another in the other reactant. Here's the general idea:



Examples of single-displacement reactions

$Cu_{(s)} + 2AgNO_{3\,(aq)} \rightleftharpoons CuNO_{3(aq)} + 2Ag_{(s)}$	When solid copper and aqueous silver nitrate react, copper replaces silver in the nitrate compound, with solid silver remaining as a product.
$Fe_{(s)} + 2HCl_{(g)} \rightleftharpoons FeCl_{2(aq)} + H_{2(g)}$	When solid iron is treated with hydrochloric acid, two chlorines from the acid combine with iron to form iron (II) chloride and hydrogen gas.
$2Al_{(s)} + Fe_2O_{3\,(aq)} \rightleftharpoons Al_2O_{3(aq)} + 2Fe_{(s)}$	Two aluminum atoms react with one atom of Iron (III) oxide in aqueous solution to form aluminum (III) oxide and solid iron.

Source: http://www.drcruzan.com/Chemistry_Reactions.html