

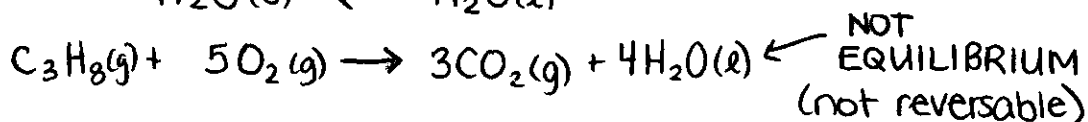
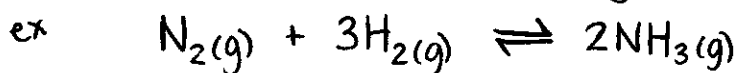
Dynamic Equilibrium

May, 22/12

dynamic = change } change that is in balance
equilibrium = balance }

Six Criteria

① Reversible chemical or physical change



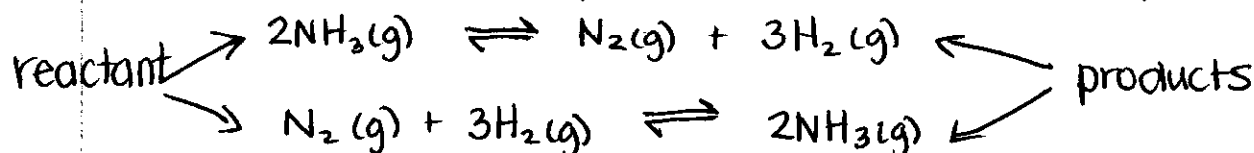
② At equilibrium the "rate" of the forward reaction is equal to the "rate" of the reverse reaction.

→ the rate that "products" form is equal to the rate that "reactants" form.

→ reactants are on the left of the \rightleftharpoons arrow

→ products are on the right of the \rightleftharpoons arrow.

→ reactants vs. products is determined by the way the equilibrium is written → you decide



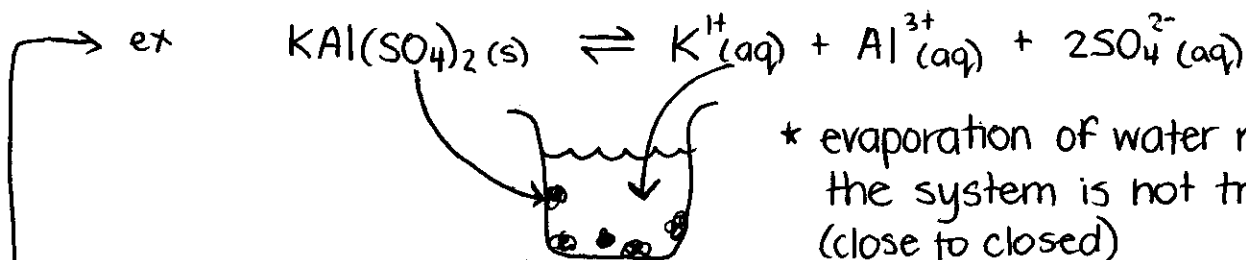
③ Consisting of observable properties

→ at equilibrium any observable remains constant (eg temperature, concentration, pressure, volume, colour, etc)
Therefore it appears as nothing is happening at equilibrium (no change)

→ equilibrium vs steady state (matter in, matter out)

④ Closed System - no matter enters or leaves (no energy enters or leaves)

→ if close to closed it is considered equilibrium over the short term



* evaporation of water means - the system is not truly closed (close to closed)

⑤ Continuous Activity at the molecular level
↳ hard to prove

solid dissolves } equal rate
ions recrystallize }

unchanging
↓
therefore fixed concentration
fixed crystal mass
but gradual change and
improvement in crystal
quality

⑥ The same equilibrium can be produced by starting with:

- reactants only
- products only
- any combination of products and reactants