

Reversible reactions mastery booklet answers

- $\text{NH}_4\text{Cl} \rightleftharpoons \text{NH}_3 + \text{HCl}$
- The symbol \rightleftharpoons
- - $\text{A(l)} + \text{B(g)} \rightleftharpoons \text{C(l)} + \text{D(g)}$
 - The products can turn back into reactants
 - Exothermic
- Exothermic in one direction means endothermic in the other
- Presence of water
- - Reversible
 - Turns from blue to pink
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 - 22, 22, 24.5
 - 22.8
 - Exothermic, temperature increases
 - Endothermic
 - Temperature would decrease
 - Endothermic in one direction is exothermic in the other
- The forward reaction rate decreases then stays constant
- The reactants get used up so there are less frequent collisions
- The amount of product is increasing so there are more frequent collisions
- Where the two lines meet
- They are the same
- Dynamic means that there is movement, reactants are still turning into products and vice versa, just at the same rate
- The same
- Reversible reaction
- More C and D will be produced
- The system will oppose the change by removing reactant and turning it to product
- The amount of C and D will decrease
- To oppose the change more reactant will be produced
- Their amount will decrease
- The system will oppose the change by increasing the amount of C and D
- 4kg
- Increase rate, more particles, more frequent collisions
- Increase them
- Endothermic
- Increase amount of C and D as reaction favours exothermic direction
- Decrease amount of A and B as reaction favours production of C and D
- As above
- A and B increase, C and D decrease as the backward reaction is favoured to raise the temperature
- Otherwise the gas will escape

30. More CaO and CO₂ produced
31. More CaCO₃ produced
32. More product formed
33. Increases the rate, particles move faster and collide more frequently. ALSO more particles will have the activation energy so more collisions result in a reaction
34. More molecules increases the pressure so opposes the change
35. Reactants
36. Reaction favours side with fewer molecules to reduce the pressure
37. There will be less reactant
38. There will be less product
39. Decrease SO₃
40. Decrease the amount of product
41. Increase
42. Low temperature, high pressure
43. None, same number of molecules on both sides
44. Otherwise the gases will escape
45. Decrease it as two gas molecules on right and one on the left
46. Increase
47. It will not change
48. Become more yellow and less brown
49. Become more brown and less yellow