Topic 9 – Kinetics and Equilibrium

Lesson 1 – Kinetics

Terms to Know

Kinetics –

Rate –

Collision Theory –

Effective Collision –

Activation Energy –

Catalyst –

Mechanism –

Factors that Affect Reaction Rates

|  |  |  |
| --- | --- | --- |
| Factor | Effect on Rate and Why | Example |
| Concentration | Rate due to in effective collisions between reacting particles | Mg + HCl  Reaction faster in 2M HCl than in 1M HCl |
| Temperature | Rate due to in kinetic energy of particles and frequency of effective collisions | AgNO3 + KI will be faster at 50°C than at 40°C |
| Pressure | Rate of gases because there will be in concentration (due to dec. in volume) | N2 + 3H2 🡪 2NH3 will occur at faster rate at pressure of 101.3 kPa than at 78 kPa |
| Surface Area | Rate because there will be in the number of exposed areas for more effective collisions to occur | HCl will react faster with powdered Mg (more surface area) than with Mg ribbon (less surface area) |
| Adding Catalyst | Rate because catalyst activation energy (lower energy pathway) for the reaction |  |
| Nature of Reactants | Ionic solutions react fast because there is no bond breaking  Molecular substances react slowly because strong covalent bonds have to be broken in the molecules  Some metals react faster than others | AgNO3 + KCl is very fast because it involves two ionic solutions  Reaction of H2 and I2 (molecular) is slow because bonds have to be broken and reformed |

