Reaction Mechanism

$$NO_2 \rightarrow NO + O$$
$$O + O_2 + M \rightarrow O_3 + M$$
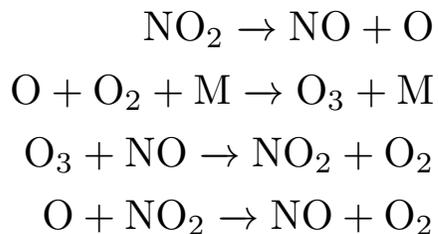$$O_3 + NO \rightarrow NO_2 + O_2$$
$$O + NO_2 \rightarrow NO + O_2$$

Parser →

Kinetic Model Data

Species:
- Names
- Number of species

Reactions:
- Type e.g., Troe, Arrhenius, CMAQ-H2O2
- Reactants and products
- Stoichiometric coefficients
- Arrhenius parameters, etc.

Sources:
- E.g., emissions

```cpp
struct ArrheniusReactionType {
  // index in reaction list
  ordinal_type _reaction_index;
  // kinetic parameters for arrhenious reaction
  double _E;
  double _A;
  double _B;
  double _C;
  double _D;
};
  // The parser stores data in the host view and
  // synchronizes it to the device view.
using arrhenius_reaction_type_1d_dual_view =
      Kokkos::DualView<ArrheniusReactionType *,  exec_space>;
```

Sync to device →

Kinetic Model Const Data
kmcd object

Share gas information ↓

Reaction Mechanism

$$ISOP\text{-}P1 \leftrightarrow ISOP\text{-}P1_{aero}$$
$$ISOP\text{-}P2 \leftrightarrow ISOP\text{-}P2_{aero}$$
$$TERP\text{-}P1 \leftrightarrow TERP\text{-}P1_{aero}$$
$$TERP\text{-}P2 \leftrightarrow TERP\text{-}P2_{aero}$$

Parser →

Aerosol Model Data

Aerosol Species:
- Number of species per particle
- Number of particles
- Physical properties

Reactions:
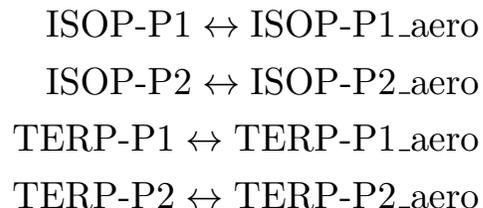- Type e.g., Simpol
- Reactants and products

Sync to device →

Aero Model Const Data
amcd object