The reaction of CO and Cl2 consists of a series of steps as outlined below:

Write an expression for  and write the overall reaction.

**Step rate constant**

Cl2 + M → 2 Cl + M k1

2 Cl + M → Cl2 + M k-1

Cl + CO + M →COCl + M k2

COCl + M → Cl + CO + M k-2

COCl + Cl2 → COCl2 + Cl k3

COCl2 + Cl → COCl + Cl2 k-3

\*M is usually taken to be an inert gas. See the Lindemann-Hinshelwood mechanism for details.