$$Rate_{forward\ phase1} = k_1 \times [E] \times [S]$$

$$Rate_{backward\ phase1} = k_2 \times [ES]$$

$$Rate_{forward\ phase2} = k_3 \times [ES]$$

Thus, the reaction rate of E is:

$$\frac{d[E]}{dt} = Rate_{backward\ phase} - Rate_{forward\ phase1}$$

$$\frac{d[E]}{dt} = k_2 \times [ES] - k_1 \times [E] \times [S]$$

As for S, since it will be consumed further when ES forms P, its rate equation has an additional term of $k_3 \times [ES]$ comparing to E's:

$$\frac{d[S]}{dt} = k_2 \times [ES] - k_1 \times [E] \times [S] + k_3 \times [ES]$$

The reaction rate of ES is:

$$\frac{d[ES]}{dt} = Rate_{forward\ phase1} - Rate_{backward\ phase} - Rate_{forward\ phase2}$$

$$\frac{d[ES]}{dt} = k_1 \times [E] \times [S] - k_2 \times [ES] - k_3 \times [ES]$$

Lastly, the reaction rate of P equals to the $Rate_{forward\ phase2}$

$$\frac{d[P]}{dt} = k_3 \times [ES]$$

Definitions:

- $k_1, k_2\ and\ k_3\ are\ given\ constants$
- $[E], [S], [ES] and\ [P] are\ concentrations\ of\ respective\ reactant\ or\ product$
- $t\ is\ Time$