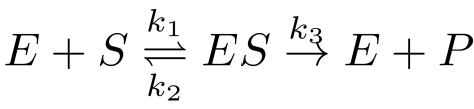
**Q2**

**For the enzyme reaction:**

****

**8.1**

Using the law of mass action, we know that:

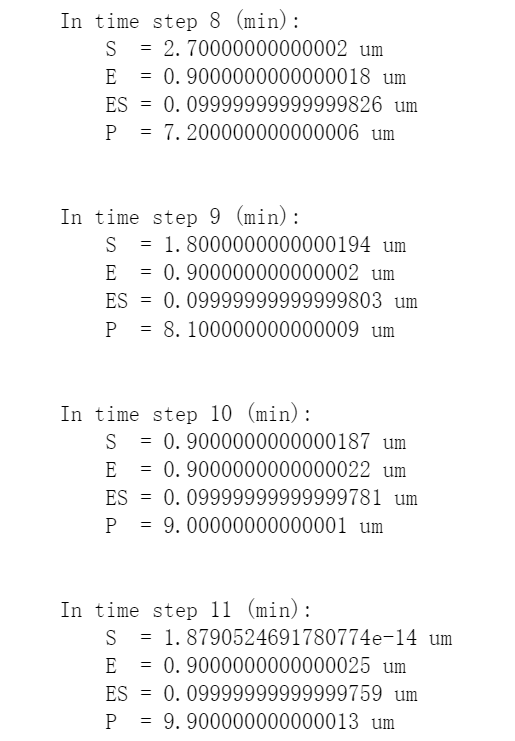
According to the rate law:

Then write **the rate of changes** using the rate law:

**8.2**

The code is written in the file “8\_2 code.py”, and the running result is shown as below:

I also write a multi-thread program to simulate the enzyme reaction and do the validation. The running result is shown as below (the code is in “simulation.py”):



The reaction will reach balanced in the minute.