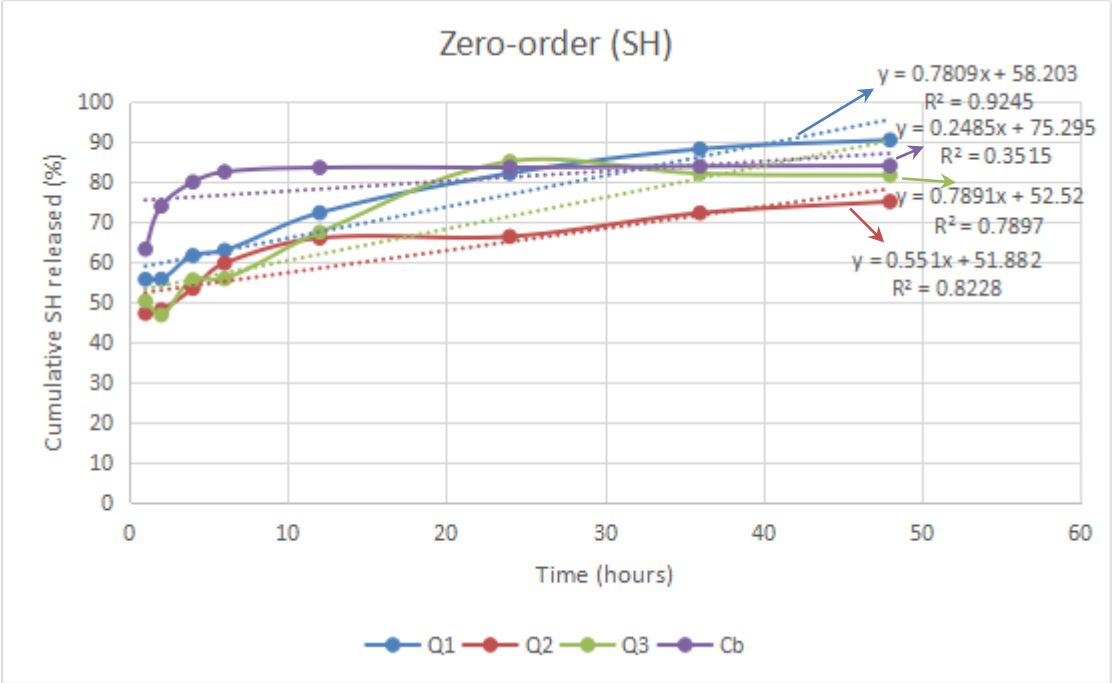
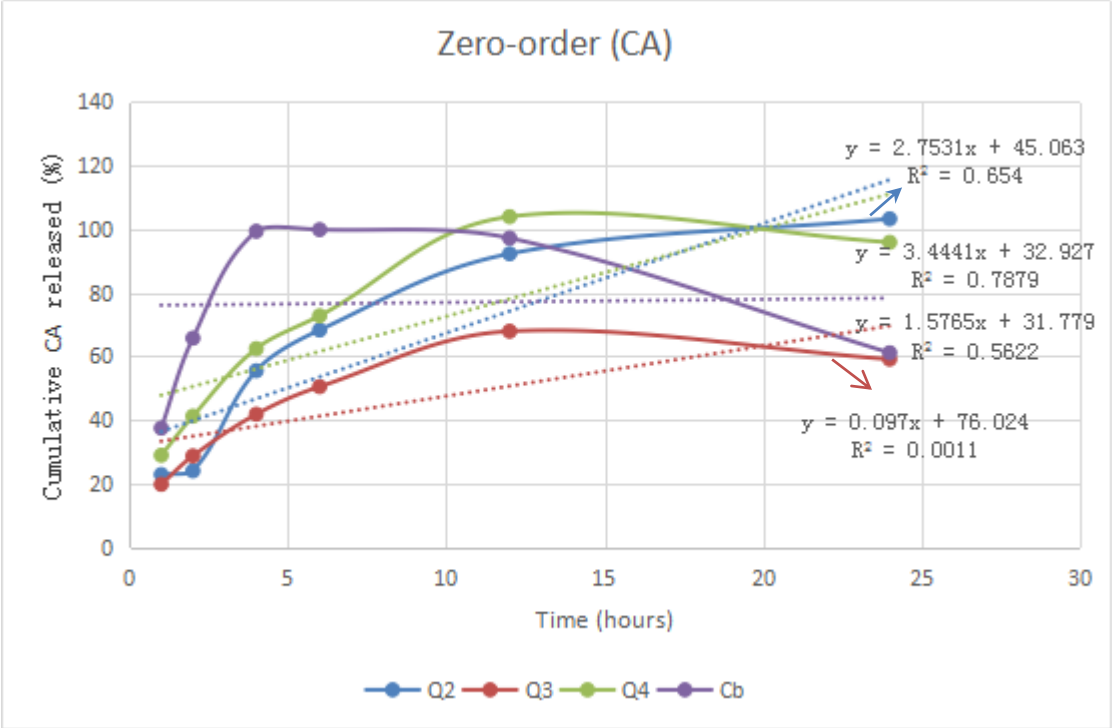
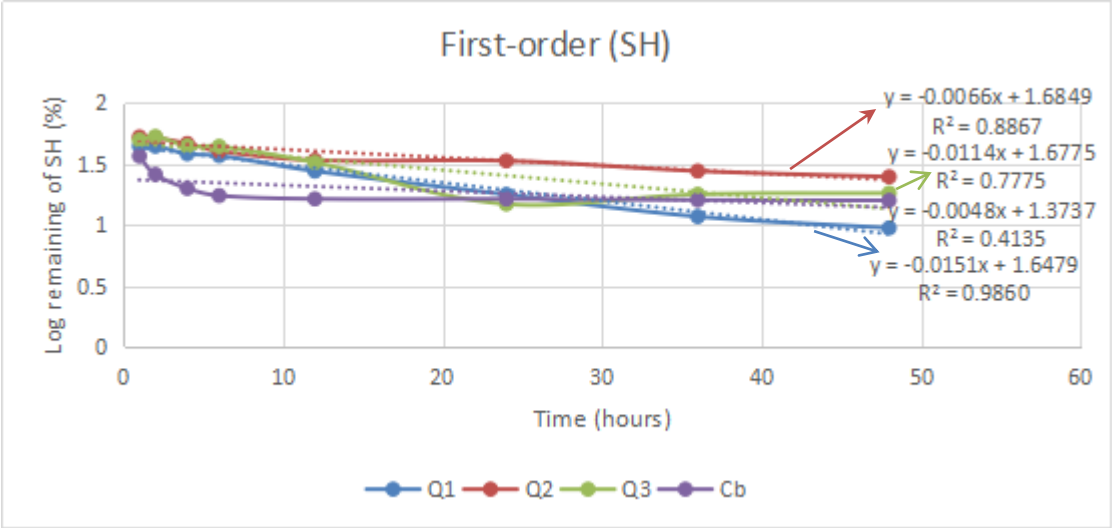
1. Kinetic data analysis of drug release

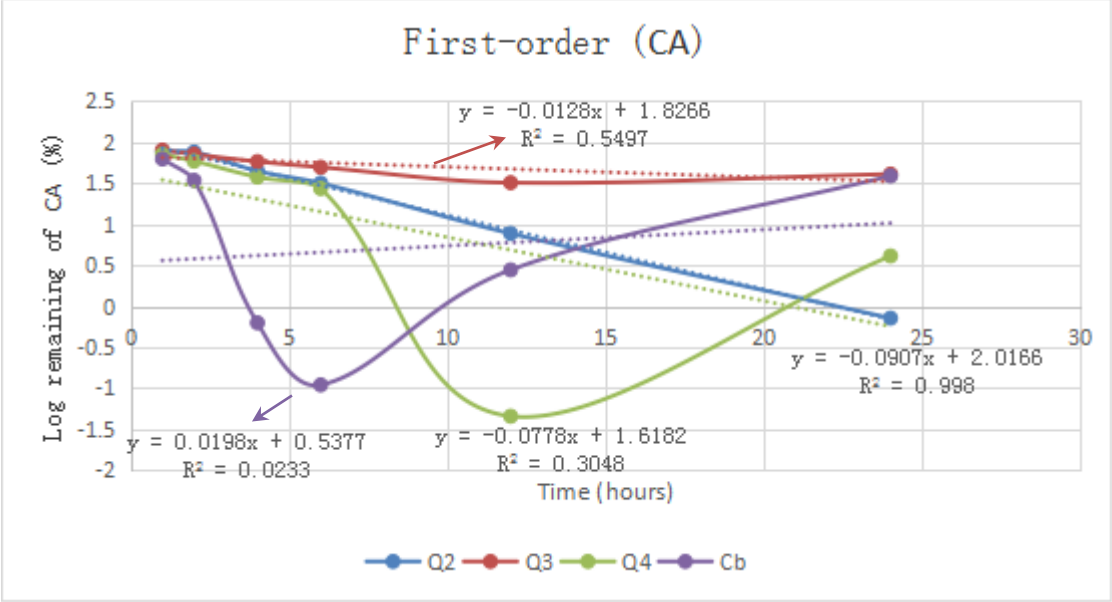
1.1 Zero-order



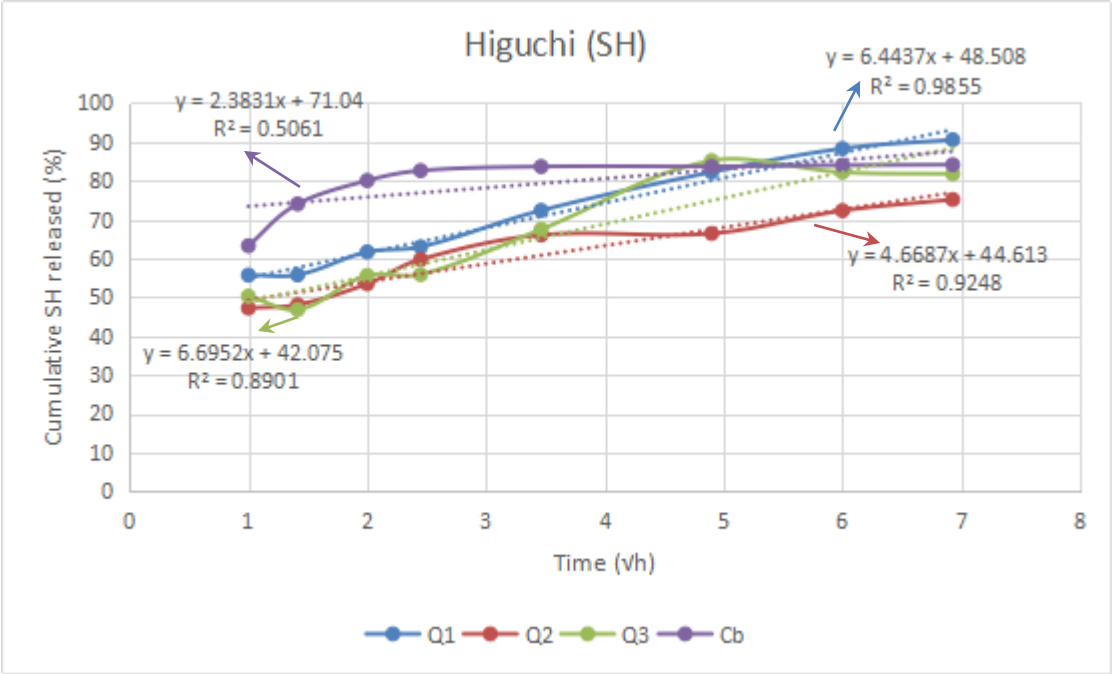


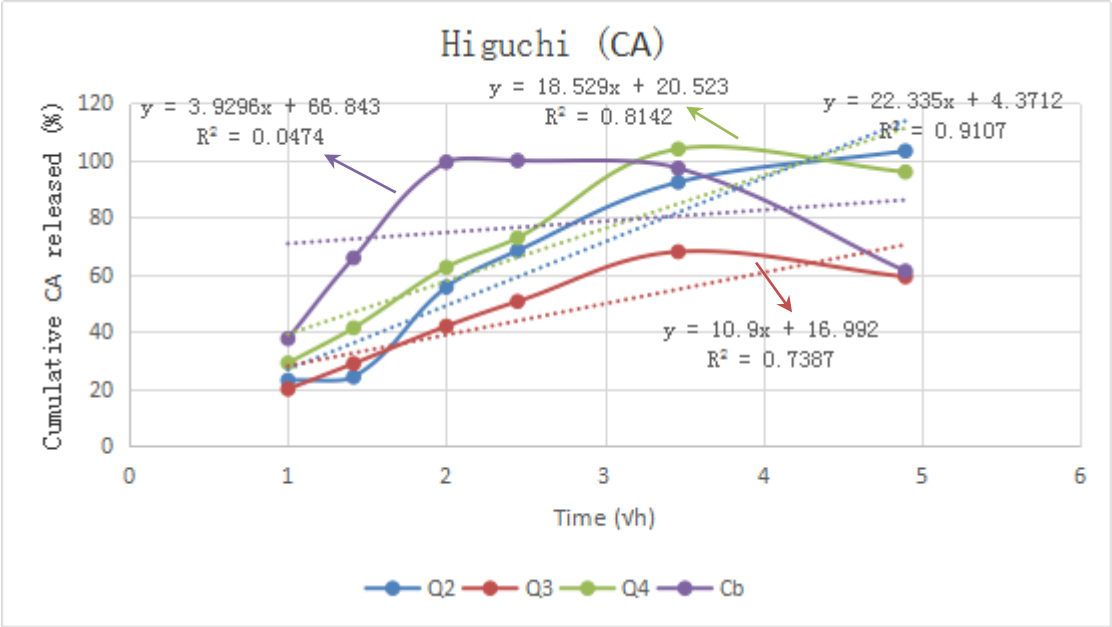
1.2 First-order



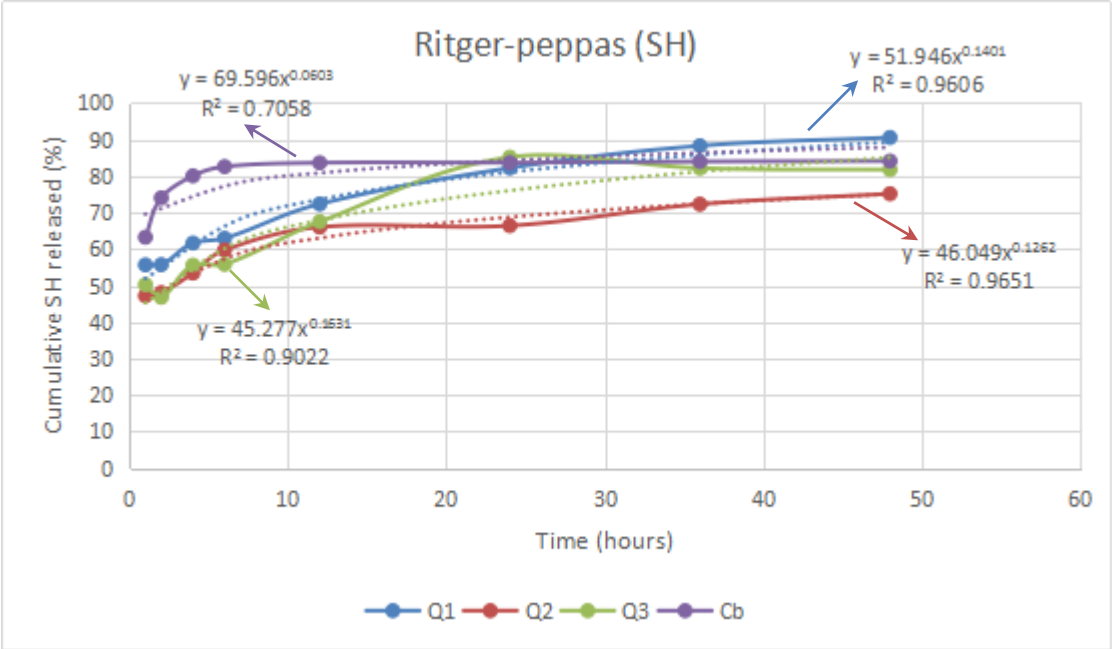


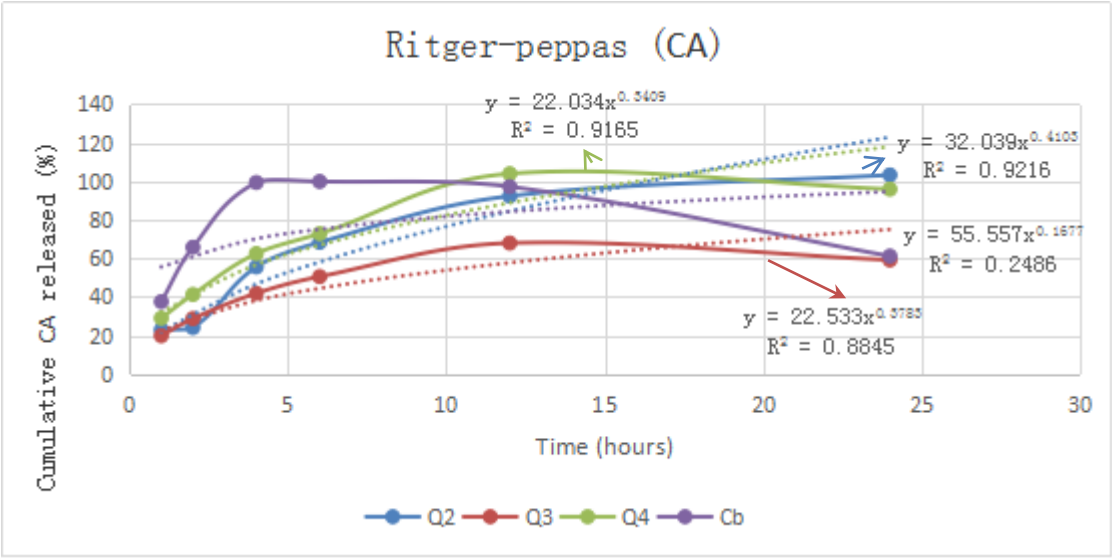
1.3 Higuchi's model





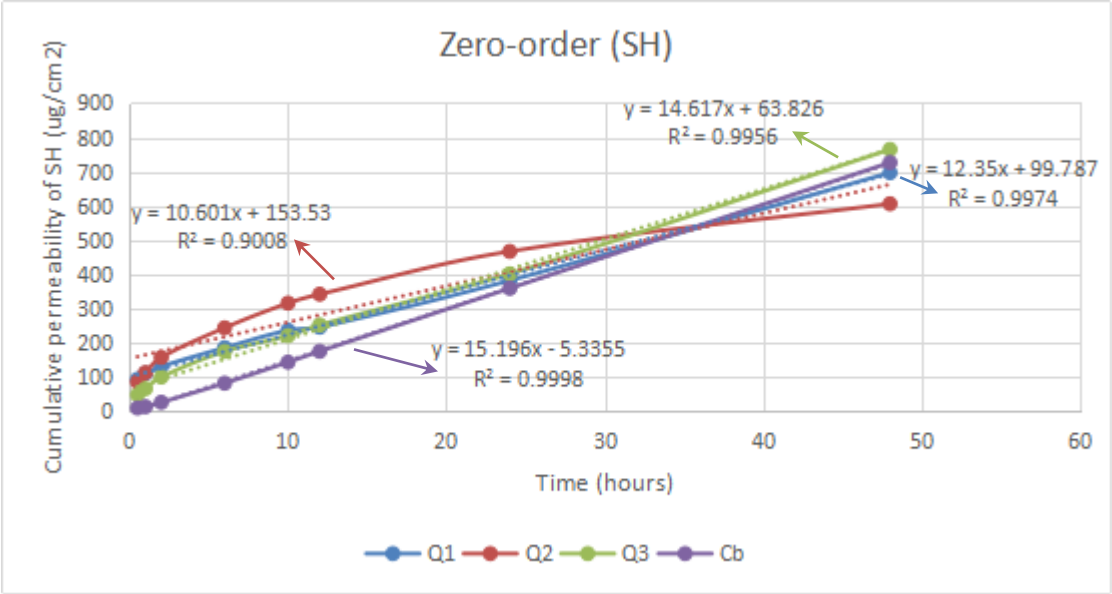
1.4 Ritger-Peppas

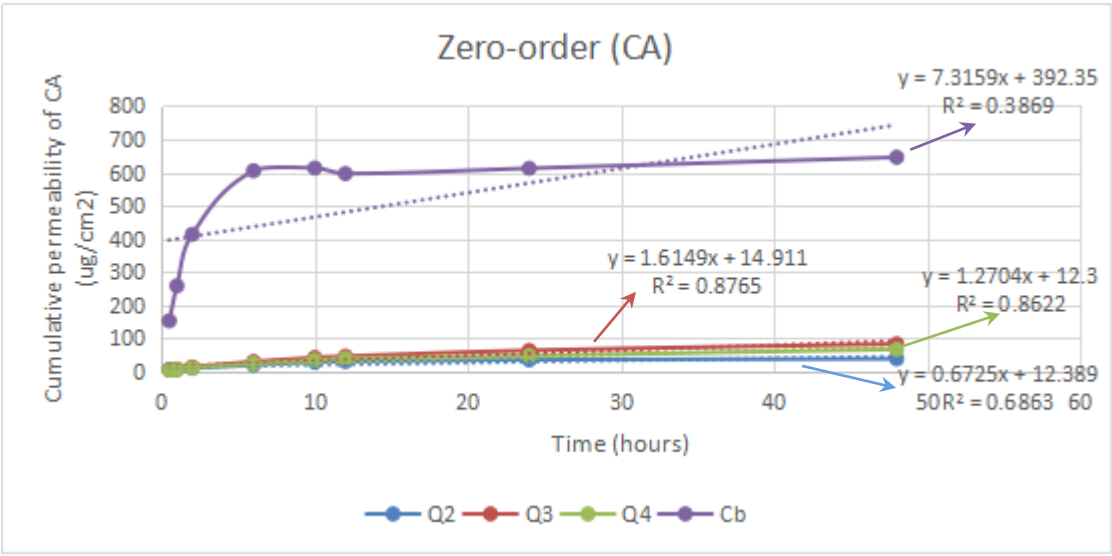




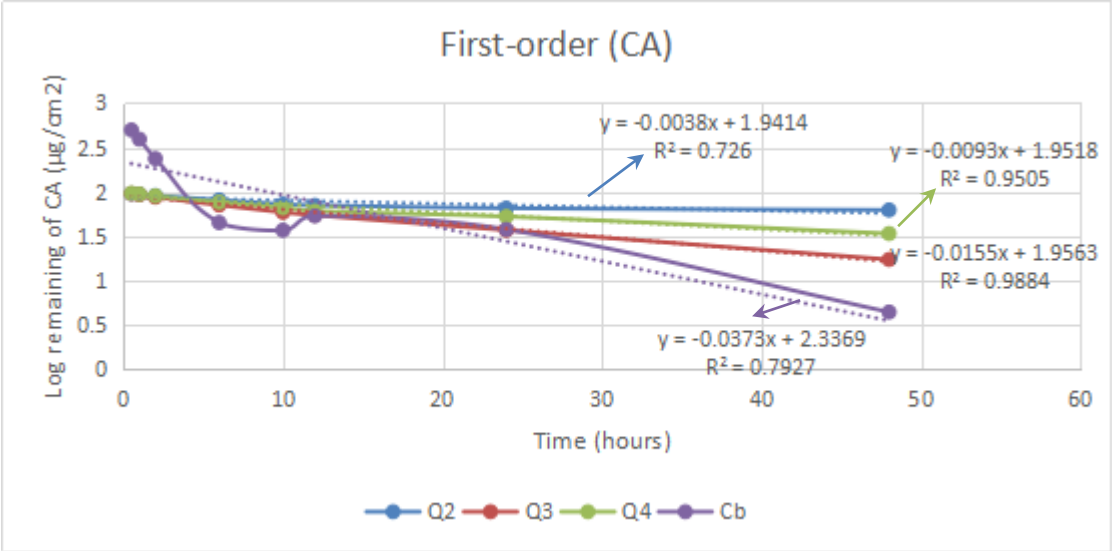
2. Kinetic data analysis of drug permeation

2.1 Zero-order

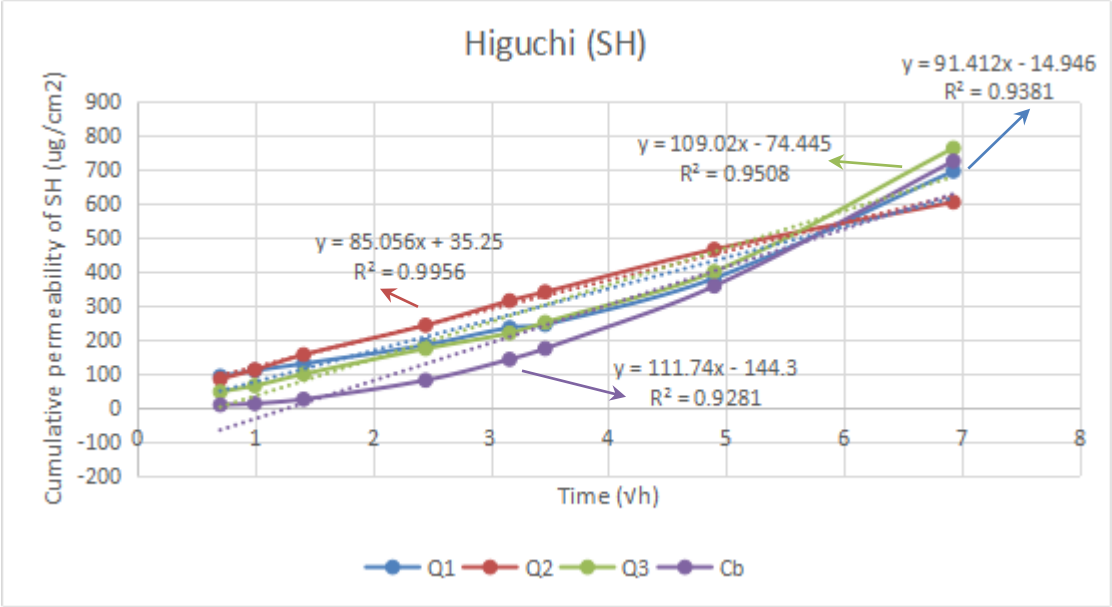


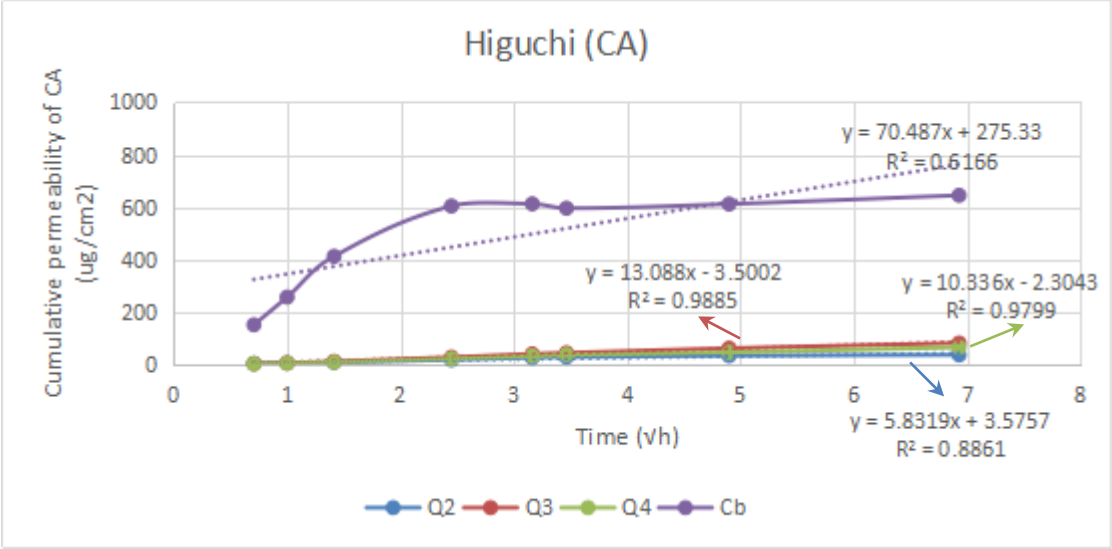


2.2 First-order

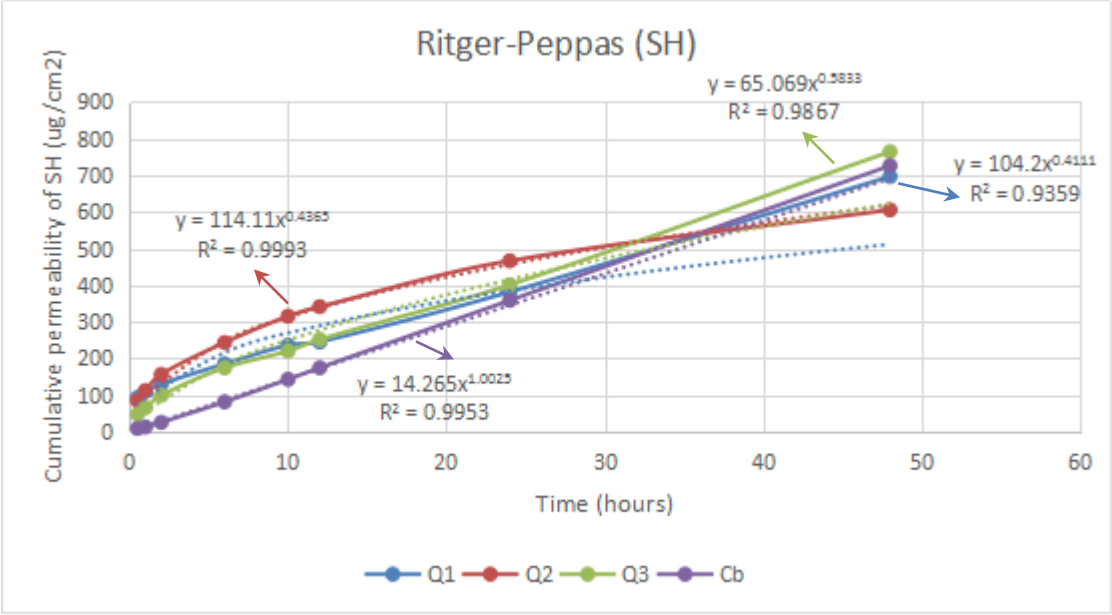


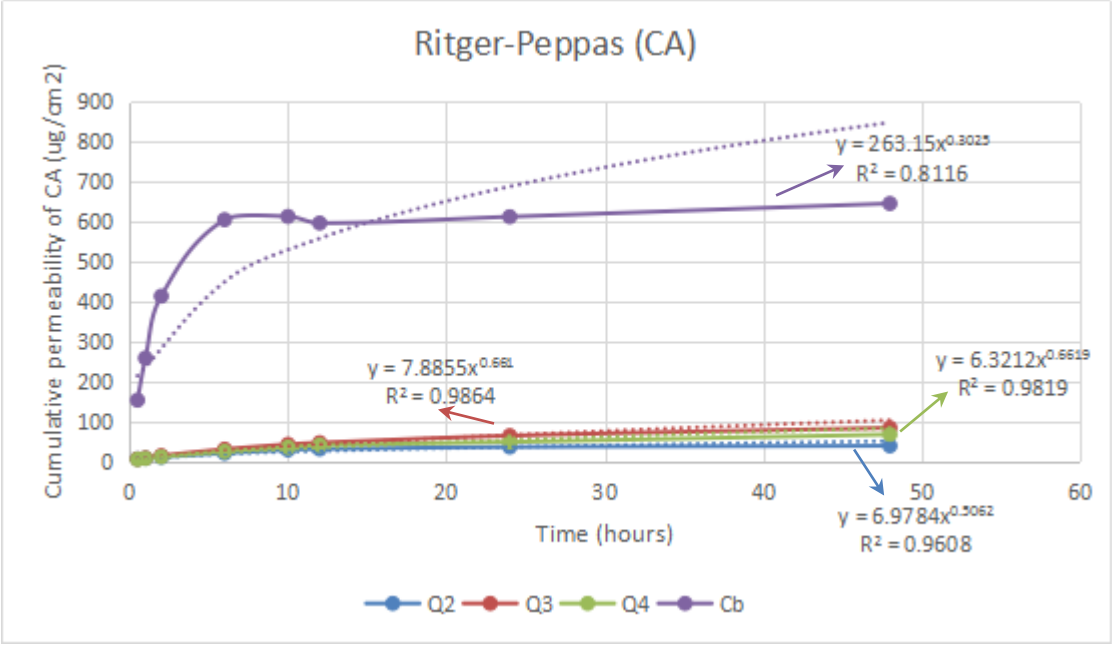
2.3 Higuchi's model





2.4 Ritger-Peppas





3. The stability of drugs

According to the conditions of drug release experiments (equal dissolution media, equal volume, equal temperature and equal speed), we conducted a drug stability study, including SH and CA. We took samples at different time points and performed quantitative analysis by HPLC. As shown in Table 1, the RSD value of SH was 0.81%, indicating the stability of SH was good under such conditions. However, it was clearly observed that the stability of CA was very poor, and its concentration was getting lower and lower with time, especially after 24 h, the decrease of CA concentration was more obvious. This can be used to reasonably explain that the cumulative release of CA showed a downward trend after 24 h.

Table 1. The comparison of concentration of SH and CA under the same conditions (%, $\bar{x} \pm s$)

Drugs	0 h	1 h	2 h	4 h	6 h	12 h	24 h	36 h	48 h	RSD
SH	100 ± 0.00	99.95 ± 4.25	98.96 ± 2.39	99.16 ± 3.30	99.85 ± 2.36	97.52 ± 3.33	99.54 ± 3.86	98.43 ± 2.67	99.29 ± 3.64	0.81 ± 0.03
CA	100 ± 0.00	96.51 ± 3.37	97.55 ± 1.43	94.56 ± 3.35	92.43 ± 3.26*	89.72 ± 2.41**	90.51 ± 4.57**	84.26 ± 3.82***	80.35 ± 3.47***	6.37 ± 2.31

* $P < 0.05$, statistically significant difference from 0 h.

** $P < 0.01$, statistically significant difference from 0 h.

*** $P < 0.005$, statistically significant difference from 0 h.