Electronic Supplementary Material (ESI) for RSC Advances.

Table T1. Values of k_{obs} and pH at different [MnO_4^-], [citric acid] and [crocin].

10^4[MnO_4^-] (mol dm^{-3})	10^3 [citric acid] (mol dm^{-3})	10^4[crocin] (mol dm^{-3})	pH	10^4 k_{obs} (s^{-1})
3.3	16.6	0.0	3.4	12.9
3.8	16.6	0.0	3.2	12.7
4.5	16.6	0.0	3.3	12.9
5.0	16.6	0.0	3.4	12.8
5.6	16.6	0.0	3.3	12.9
6.6	16.6	0.0	3.4	12.8
6.6	3.3	0.0	3.2	0.72
6.6	5.0	0.0	3.4	1.9
6.6	6.6	0.0	3.3	3.5
6.6	8.3	0.0	3.4	6.2
6.6	10.0	0.0	3.2	8.5
6.6	11.6	0.0	3.4	9.6
6.6	13.3	0.0	3.3	10.2
6.6	15.0	0.0	3.4	11.5
6.6	16.6	0.0	3.2	12.9
6.6	0.0	5.0	6.7	1.0
6.6	0.0	7.5	6.6	1.7
6.6	0.0	10.0	6.6	2.8
6.6	0.0	12.5	6.7	3.4
6.6	0.0	15.0	6.6	3.8
6.6	0.0	17.5	6.7	4.3
6.6	0.0	20.0	6.7	4.8

Table T2. Values of k_{obs} and pH at different [citric acid] and [crocin] with $[MnO_4^-]$ = 6.6×10^{-4} mol dm^{-3}.

$10^4[MnO_4^-]$ (mol dm^{-3})	10^3 [citric acid] (mol dm^{-3})	10^4[crocin] (mol dm^{-3})	pH	10^4 k_{obs} (s^{-1})
6.6	0.0	5.0	6.7	1.0
6.6	3.3	5.0	3.2	2.3
6.6	5.5	5.0	3.4	4.8
6.6	6.6	5.0	3.3	7.3
6.6	8.3	5.0	3.4	9.9
6.6	10.0	5.0	3.3	12.6
6.6	11.6	5.0	3.4	14.6
6.6	13.3	5.0	3.3	16.6
6.6	15.0	5.0	3.4	19.0
6.6	16.6	5.0	3.2	21.2
6.6	16.6	7.5	3.2	32.0
6.6	16.6	10.0	3.4	41.5
6.6	16.6	12.5	3.4	47.6
6.6	16.6	15.0	3.4	54.0
6.6	16.6	17.5	3.3	57.7
6.6	16.6	20.0	3.4	61.9

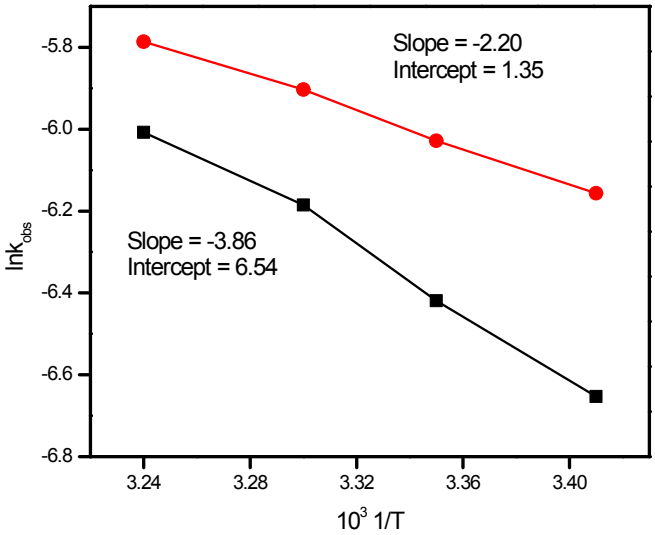

Fig. S1. Plot of $\ln k_{obs}$ versus 1/T. *Reaction conditions*: $[MnO_4^-] = 6.6 \times 10^{-4}$ mol dm^{-3} (● and ■), [citric acid] = 16.6×10^{-3} mol dm^{-3} (● and ■), [crocin] = 5.0×10^{-4} mol dm^{-3} (●).

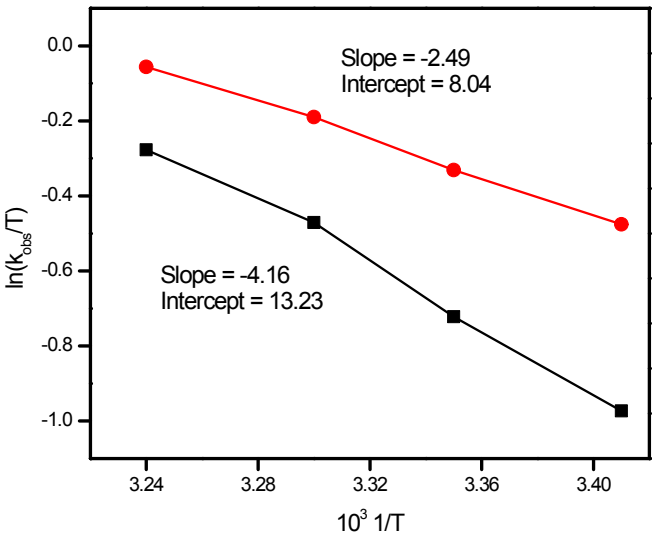

Fig. S2. Plot of $\ln(k_{obs}/T)$ versus 1/T. *Reaction conditions:* $[MnO_4^-] = 6.6 \times 10^{-4}$ mol dm^{-3} (● and ■), [citric acid] = 16.6×10^{-3} mol dm^{-3} (● and ■), [crocin] = 5.0×10^{-4} mol dm^{-3} (●).