

Series F. Potassium chlorate and potassium iodide in comparable quantities; hydrochloric acid in excess

Effect of the Chlorate and of the Iodide.—Throughout each experiment of this series, k_2 is fairly constant.¹

Comparing the values of k_2 for the different experiments, it will be seen that doubling the initial concentration of the chlorate leaves k_2 unaltered (Expts. 27 and 29; 28 and 30), while doubling that of the iodide diminishes k_2 (Expts. 27 and 28; 29 and 30; 31 and 27). Hence the rate is proportional to the concentration of the chlorate, and less than proportional to that of the iodide.

Effect of the Acid.—Increase from 4.98 to 10.1 units (Expt. 33) multiplies the rate by 4 or 4.8; further increase from 10.1 to 15.2 multiplies it by 3.5 (Expt. 32).

EXPTS. 27, 28 AND 29.

27. A 1.0; B 0.965; C 10.10. 28. A 1.0; B 1.93; C 9.95. 29. A 2.0; B 0.965; C 10.1.

θ	100.r	$k_2 \times 10^4$	θ	100.r	$k_2 \times 10^4$	θ	100.r	$k_2 \times 10^4$
150	3.3	2.29	1072	24.6	1.49	90	3.8	2.16
1085	18.5	2.09	1195	26.7	1.40	171	6.9	2.13
1262	21.2	2.13	1396	29.3	1.36	1168	35.1	2.05
1390	23.0	2.18	2441	44.1	1.36	1269	36.5	2.00
2448	33.7	2.08	2541	45.0	1.35	—	—	—
—	—	—	5321	66.6	1.48	—	—	—
—	—	—	5730	69.7	1.33	—	—	—

R = 0.0229

R = 0.0298

R = 0.0432

EXPTS. 30 AND 31.

30. A 2.0; B 1.93; C 9.95.

31. A 1.0; B 0.482; C 10.16.

θ	100.r	$k_2 \times 10^4$	θ	100.r
126	7.5	1.56	129	2.4
233	12.9	1.42	279	5.05
360	18.5	1.42	385	6.7
1366	54.8	1.41	1362	18.5

R = 0.062

R = 0.0186

¹ $k_2 = 1/(A-x) - 1/A$.