SOLVAY SOLEXIS

From [redacted]

Object: determination of the Ka of the [redacted] acid by means of tiration

The determination of the K_a of the [redacted] has been made titrating with NaOH 0.1N a 0.165% aqueous solution of the product. It has been worked on this acid because it is the only one of the series, with surfactant characteristics, to having a water solubility to allow the acidimetric titration

The titration has been carried out very slowly in order to allow the electrode to stabilize after every adding.

In the strong acid case, in fact, it is absolutely necessary a very precise measurement of the potential, point-to-point, from which $[H^+]$ is obtained.

The integral formula of Henderson we used, sets as denominator the difference: [residual acid]-[H+]. If the electrode is not at the the stability point, $[H^+]$, that decreases during the titration, is overestimated and the difference turns out negative like, consequently, the K_a:

$$K_a = [H^+] * ([A^-]+[H^+])/([HA] - [H^+])$$

In comparison it has been calculated also the K_a of hydrochloric acid.

From the results, it can be concluded that the two acids have a similar acid power (within the analytical error)

HCl Ka (average value) = 0.1162

[redacted] Ka (average value) = 0.1633

Ka=H*(A+H)/(HA-H)

Fitting curve
mV=389,28-56,29pH

HCl 0.1N (5 ml in 150 ml of H2O)

ml	mv	pH	Ka	pKa
0	246,5	2,537	0,0177	1,7508
0,31	245,9	2,547	0,0259	1,5869
0,61	244,7	2,568	0,0318	1,4977
0,91	243,4	2,592	0,0407	1,3903
1,21	241,8	2,620	0,0487	1,3121
1,51	240	2,652	0,0577	1,2391
1,81	238	2,688	0,0684	1,1649
2,11	235,8	2,727	0,0843	1,0744
2,41	233,4	2,769	0,1175	0,9299
2,71	230,6	2,819	0,1573	0,8031
3,01	227,4	2,876	0,2338	0,6312
3,31	223,7	2,942	0,5105	0,292
3,61	219,2	3,021	1,4282	-0,1548
3,91	213,6	3,121	9,4478	-0,9753

Ka (Vm) 0,1162

Taratura
mV=388,468-56,6289pH

n2 (g.0.2475 in 150 ml of H2O)

ml	mv	pH	Ka	pKa
0	249	2,4628	0,1091	0,9622
0,31	248,5	2,501	0,0574	1,2411
0,61	247,2	2,5241	0,0714	1,1464
0,91	245,9	2,5472	0,1058	0,9757
1,21	244,3	2,5756	0,1355	0,8679
1,51	242,6	2,6058	0,2009	0,697
1,81	240,6	2,6413	0,227	0,644
2,11	238,4	2,6804	0,2439	0,6128
2,41	235,9	2,7248	0,2064	0,6853
2,71	233,3	2,771	0,2726	0,5644
3,01	230,3	2,8243	0,2918	0,5348
3,31	226,8	2,8865	0,2357	0,6277
3,61	222,7	2,9593	0,1744	0,7584
3,91	217,8	3,0464	0,1284	0,8915
4,21	211,8	3,153	0,1034	0,9853
4,51	203,3	3,304	0,0495	1,3054

Ka (Vm) 0,1633