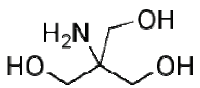
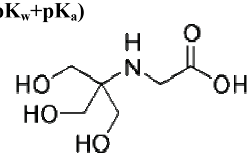
pK_w, współczynnik aktywności jonów H_3O^+ i wartości pK_a kwasów Brönsteda w zależności od siły jonowej roztworu

Kwas Brönsteda	\ I pK_a \	**0,000**	**0,050**	**0,100**	**0,150**	**0,200**	**0,250**	**0,300**	**0,350**	**0,400**	**0,450**	**0,500**	**0,550**	**0,600**	**0,650**	**0,700**	**0,750**	**0,800**	**0,850**	**0,900**	**0,950**	**1,00**
H_2O	pK_w	14,000	13,840	13,801	13,778	13,764	13,755	13,748	13,744	13,742	13,740	13,740	13,741	13,743	13,745	13,747	13,751	13,754	13,758	13,762	13,766	13,771
H_3O^+	**f_{H3O+}**	**1,000**	**0,8284**	**0,7903**	**0,7687**	**0,7546**	**0,7448**	**0,7377**	**0,7326**	**0,7290**	**0,7265**	**0,7249**	**0,7240**	**0,7237**	**0,7239**	**0,7246**	**0,7256**	**0,7269**	**0,7286**	**0,7305**	**0,7327**	**0,7351**
log(**f_{H3O+}**)		**0,0000**	**-0,0818**	**-0,1022**	**-0,1142**	**-0,1223**	**-0,1280**	**-0,1321**	**-0,1351**	**-0,1373**	**-0,1388**	**-0,1397**	**-0,1403**	**-0,1404**	**-0,1403**	**-0,1399**	**-0,1393**	**-0,1385**	**-0,1375**	**-0,1364**	**-0,1351**	**-0,1337**
CH_3COOH	pK_a	4,757	4,596	4,556	4,532	4,517	4,507	4,499	4,494	4,491	4,488	4,487	4,487	4,488	4,489	4,490	4,493	4,495	4,498	4,501	4,504	4,508
$ClCH_2COOH$	pK_a	2,865	2,704	2,664	2,640	2,625	2,615	2,607	2,602	2,599	2,596	2,595	2,595	2,596	2,597	2,598	2,601	2,603	2,606	2,609	2,612	2,616
$HCOOH$	pK_a	3,745	3,565	3,507	3,465	3,431	3,402	3,376	3,353	3,331	3,310	3,290	3,272	3,254	3,236	3,219	3,203	3,187	3,171	3,156	3,141	3,126
C_6H_5COOH	pK_a	4,190	4,029	3,989	3,965	3,950	3,940	3,932	3,927	3,924	3,921	3,920	3,920	3,921	3,922	3,923	3,926	3,928	3,931	3,934	3,937	3,941
$H_2C_2O_4$	pK_{a1}	1,252	1,072	1,014	0,972	0,938	0,909	0,883	0,860	0,838	0,817	0,797	0,779	0,761	0,743	0,726	0,710	0,694	0,678	0,663	0,648	0,633
$H_2C_2O_4$	pK_{a2}	4,266	3,916	3,809	3,736	3,680	3,632	3,591	3,554	3,521	3,490	3,462	3,435	3,410	3,386	3,363	3,340	3,319	3,298	3,278	3,259	3,240
H_2CO_3	pK_{a1}	6,352	6,184	6,138	6,108	6,086	6,069	6,055	6,044	6,034	6,025	6,017	6,011	6,005	5,999	5,994	5,990	5,986	5,982	5,979	5,976	5,973
H_2CO_3	pK_{a2}	10,329	9,998	9,910	9,856	9,819	9,790	9,768	9,750	9,736	9,724	9,715	9,707	9,701	9,696	9,692	9,688	9,686	9,684	9,683	9,683	9,683
HN_3	pK_a	4,720	4,540	4,482	4,440	4,406	4,377	4,351	4,328	4,306	4,285	4,265	4,247	4,229	4,211	4,194	4,178	4,162	4,146	4,131	4,116	4,101
H_3PO_4	pK_{a1}	2,148	1,976	1,926	1,892	1,866	1,845	1,827	1,812	1,798	1,785	1,773	1,763	1,753	1,743	1,734	1,726	1,718	1,710	1,703	1,696	1,689
H_3PO_4	pK_{a2}	7,199	6,859	6,762	6,699	6,653	6,615	6,584	6,557	6,534	6,513	6,495	6,478	6,463	6,449	6,436	6,423	6,412	6,401	6,391	6,382	6,373
H_3PO_4	pK_{a3}	12,350	11,845	11,706	11,617	11,553	11,503	11,462	11,428	11,399	11,373	11,351	11,332	11,315	11,300	11,286	11,273	11,262	11,252	11,243	11,234	11,226
H_2S	pK_{a1}	7,000	6,820	6,762	6,720	6,686	6,657	6,631	6,608	6,586	6,565	6,545	6,527	6,509	6,491	6,474	6,458	6,442	6,426	6,411	6,396	6,381
H_2S	pK_{a2}	12,920	12,580	12,483	12,420	12,374	12,336	12,305	12,278	12,255	12,234	12,216	12,199	12,184	12,170	12,157	12,144	12,133	12,122	12,112	12,103	12,094
H_2SO_4	pK_{a2}	1,990	1,652	1,557	1,496	1,452	1,416	1,387	1,362	1,341	1,322	1,306	1,291	1,278	1,266	1,255	1,244	1,235	1,226	1,218	1,211	1,204
NH_4^+	pK_a	9,244	9,077	9,032	9,003	8,982	8,966	8,953	8,943	8,934	8,926	8,919	8,914	8,909	8,904	8,900	8,897	8,894	8,891	8,889	8,887	8,885
$CH_3NH_3^+$	pK_a	10,640	10,473	10,428	10,399	10,378	10,362	10,349	10,339	10,330	10,322	10,315	10,310	10,305	10,300	10,296	10,293	10,290	10,287	10,285	10,283	10,281
$(CH_3)_2NH_2^+$	pK_a	10,610	10,443	10,398	10,369	10,348	10,332	10,319	10,309	10,300	10,292	10,285	10,280	10,275	10,270	10,266	10,263	10,260	10,257	10,255	10,253	10,251
$C_6H_5NH_2^+$	pK_a	4,580	4,413	4,368	4,339	4,318	4,302	4,289	4,279	4,270	4,262	4,255	4,250	4,245	4,240	4,236	4,233	4,230	4,227	4,225	4,223	4,221
TRIS	pK_a	8,060	7,890	7,841	7,808	7,784	7,765	7,748	7,734	7,722	7,710	7,700	7,691	7,683	7,675	7,667	7,661	7,654	7,648	7,642	7,636	7,631
TRICINE	pK_a	8,150	7,980	7,931	7,898	7,874	7,855	7,838	7,824	7,812	7,800	7,790	7,781	7,773	7,765	7,757	7,751	7,744	7,738	7,732	7,726	7,721

Dla danej siły jonowej **$K_a \cdot K_b = K_w$**, stąd **$pK_a + pK_b = pK_w$**, gdzie symbol **pK_a** oznacza ujemny logarytm ze stałej **K_a**, a **pK_b** oznacza ujemny logarytm ze stałej **K_b** .Stałą kwasowości wyliczamy z **pK_a** jako **antylog(–pK_a)**, a stałą zasadowości wyliczamy z **pK_w** i **pK_a** jako **antylog(–pK_w+pK_a)**



TRIS



TRICINE

Typ soli	Roztwór buforowy	Hydroliza	Stopień hydrolizy
BH^+X^- (np.:NH_4Cl)	$[H_3O^+] = K'_{BH^+} \cdot c \cdot \frac{1}{c_B}$	$[H_3O^+] = \sqrt{K'_{BH^+} \cdot c}$	$\beta = \sqrt{\frac{K'_{BH^+}}{c}}$
A^-M^+ (np.:CH_3COONa)	$[H_3O^+] = \frac{K'_{HA}}{c} \cdot c_{HA}$	$[H_3O^+] = \sqrt{\frac{K'_{AH}}{c} \cdot K'_w}$	$\beta = \sqrt{\frac{K'_w}{K'_{AH} \cdot c}}$
*BH^+A^- (np.:CH_3COONH_4)	–	$[H_3O^+] = \sqrt{K'_{HA} \cdot K'_{BH^+}}$	$\beta = \sqrt{\frac{K'_{BH^+}}{K'_{HA}}}$
*M^+HA^- (np.: $NaHCO_3$)	–	$[H_3O^+] = \sqrt{K'_{a1} \cdot K'_{a2}}$	$\beta = \sqrt{\frac{K'_{a2}}{K'_{a1}}}$

**tylko hydroliza soli.*