

## UNITÀ SCONSIGLIATE O DA ABBANDONARE

Grandezza fisica	Unità	Simbolo	In unità SI
lunghezza	angstrom	Å	$1,00 \cdot 10^{-10}$ m
forza	dine	din	$1,00 \cdot 10^{-6}$ N
energia	erg	erg	$1,00 \cdot 10^{-7}$ J
energia	caloria	cal	4,184 J
pressione	atmosfera	atm	$1,01325 \cdot 10^5$ Pa
pressione	millimetro di mercurio	mm Hg	$1,33322 \cdot 10^2$ Pa
pressione	torr	torr	$1,33322 \cdot 10^2$ Pa

## COSTANTI DI IONIZZAZIONE DI ACIDI DEBOLI A 25°C

Nome dell'acido	Formula	K <sub>a</sub>
Acetico	$\text{CH}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CH}_3\text{COO}^-$	$K = 1,8 \cdot 10^{-5}$
cloroacetico	$\text{CH}_2\text{ClCOOH} \rightleftharpoons \text{H}^+ + \text{CH}_2\text{ClCOO}^-$	$K = 1,4 \cdot 10^{-3}$
dicloroacetico	$\text{CHCl}_2\text{COOH} \rightleftharpoons \text{H}^+ + \text{CHCl}_2\text{COO}^-$	$K = 5,5 \cdot 10^{-2}$
tricloroacetico	$\text{CCl}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CCl}_3\text{COO}^-$	$K = 3,0 \cdot 10^{-1}$
fluoroacetico	$\text{CH}_2\text{FCOOH} \rightleftharpoons \text{H}^+ + \text{CH}_2\text{FCOO}^-$	$K = 2,6 \cdot 10^{-3}$
trifluoroacetico	$\text{CF}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CF}_3\text{COO}^-$	$K = 5,9 \cdot 10^{-1}$
Arsenico	$\text{H}_3\text{AsO}_4 \rightleftharpoons \text{H}^+ + \text{H}_2\text{AsO}_4^-$	$K_1 = 2,5 \cdot 10^{-4}$
	$\text{H}_2\text{AsO}_4^- \rightleftharpoons \text{H}^+ + \text{HAsO}_4^{2-}$	$K_2 = 5,6 \cdot 10^{-8}$
	$\text{HAsO}_4^{2-} \rightleftharpoons \text{H}^+ + \text{AsO}_4^{3-}$	$K_3 = 3,0 \cdot 10^{-13}$
Arsenioso	$\text{H}_3\text{AsO}_3 \rightleftharpoons \text{H}^+ + \text{H}_2\text{AsO}_3^-$	$K_1 = 6,0 \cdot 10^{-10}$
	$\text{H}_2\text{AsO}_3^- \rightleftharpoons \text{H}^+ + \text{HAsO}_3^{2-}$	$K_2 = 3,0 \cdot 10^{-14}$
Azotidrico	$\text{HN}_3 \rightleftharpoons \text{H}^+ + \text{N}_3^-$	$K = 1,9 \cdot 10^{-5}$
Benzoico	$\text{C}_6\text{H}_5\text{COOH} \rightleftharpoons \text{H}^+ + \text{C}_6\text{H}_5\text{COO}^-$	$K = 6,3 \cdot 10^{-5}$
Borico	$\text{H}_3\text{BO}_3 \rightleftharpoons \text{H}^+ + \text{H}_2\text{BO}_3^-$	$K_1 = 7,3 \cdot 10^{-10}$
	$\text{H}_2\text{BO}_3^- \rightleftharpoons \text{H}^+ + \text{HBO}_3^{2-}$	$K_2 = 1,8 \cdot 10^{-13}$
	$\text{HBO}_3^{2-} \rightleftharpoons \text{H}^+ + \text{BO}_3^{3-}$	$K_3 = 1,6 \cdot 10^{-14}$
Carbonico	$\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$	$K_1 = 4,2 \cdot 10^{-7}$
	$\text{HCO}_3^- \rightleftharpoons \text{H}^+ + \text{CO}_3^{2-}$	$K_2 = 4,8 \cdot 10^{-11}$
Cianidrico	$\text{HCN} \rightleftharpoons \text{H}^+ + \text{CN}^-$	$K = 6,2 \cdot 10^{-10}$
Citrico	$\text{C}_3\text{H}_5\text{O}(\text{COOH})_3 \rightleftharpoons \text{H}^+ + \text{C}_3\text{H}_5\text{O}(\text{COOH})_2\text{COO}^-$	$K_1 = 7,4 \cdot 10^{-3}$
	$\text{C}_3\text{H}_5\text{O}(\text{COOH})_2\text{COO}^- \rightleftharpoons \text{H}^+ + \text{C}_3\text{H}_5\text{O}(\text{COOH})(\text{COO}^-)_2$	$K_2 = 1,7 \cdot 10^{-5}$
	$\text{C}_3\text{H}_5\text{O}(\text{COOH})(\text{COO}^-)_2 \rightleftharpoons \text{H}^+ + \text{C}_3\text{H}_5\text{O}(\text{COO}^-)_3$	$K_3 = 4,0 \cdot 10^{-7}$
Cloroso	$\text{HClO}_2 \rightleftharpoons \text{H}^+ + \text{ClO}_2^-$	$K = 1,1 \cdot 10^{-2}$
Fenolo	$\text{C}_6\text{H}_5\text{OH} \rightleftharpoons \text{H}^+ + \text{C}_6\text{H}_5\text{O}^-$	$K = 1,3 \cdot 10^{-10}$
Fluoridrico	$\text{HF} \rightleftharpoons \text{H}^+ + \text{F}^-$	$K = 7,2 \cdot 10^{-4}$
Formico	$\text{HCOOH} \rightleftharpoons \text{H}^+ + \text{HCOO}^-$	$K = 1,8 \cdot 10^{-4}$
Fosforico	$\text{H}_3\text{PO}_4 \rightleftharpoons \text{H}^+ + \text{H}_2\text{PO}_4^-$	$K_1 = 7,5 \cdot 10^{-3}$
	$\text{H}_2\text{PO}_4^- \rightleftharpoons \text{H}^+ + \text{HPO}_4^{2-}$	$K_2 = 6,2 \cdot 10^{-8}$
	$\text{HPO}_4^{2-} \rightleftharpoons \text{H}^+ + \text{PO}_4^{3-}$	$K_3 = 3,6 \cdot 10^{-13}$
Fosforoso	$\text{H}_3\text{PO}_3 \rightleftharpoons \text{H}^+ + \text{H}_2\text{PO}_3^-$	$K_1 = 1,6 \cdot 10^{-2}$
	$\text{H}_2\text{PO}_3^- \rightleftharpoons \text{H}^+ + \text{HPO}_3^{2-}$	$K_2 = 7,0 \cdot 10^{-7}$
Ipbromoso	$\text{HBrO} \rightleftharpoons \text{H}^+ + \text{BrO}^-$	$K = 2,5 \cdot 10^{-9}$

**COSTANTI DI IONIZZAZIONE DI ACIDI DEBOLI A 25°C** (continua)

Nome dell'acido	Formula	K <sub>a</sub>
Ipocloroso	$\text{HClO} \rightleftharpoons \text{H}^+ + \text{ClO}^-$	$K = 3,5 \cdot 10^{-8}$
Nitroso	$\text{HNO}_2 \rightleftharpoons \text{H}^+ + \text{NO}_2^-$	$K = 4,5 \cdot 10^{-4}$
Ossalico	$\text{H}_2\text{C}_2\text{O}_4 \rightleftharpoons \text{H}^+ + \text{HC}_2\text{O}_4^-$	$K_1 = 5,9 \cdot 10^{-2}$
	$\text{HC}_2\text{O}_4^- \rightleftharpoons \text{H}^+ + \text{C}_2\text{O}_4^{2-}$	$K_2 = 6,4 \cdot 10^{-5}$
Perossido di idrogeno	$\text{H}_2\text{O}_2 \rightleftharpoons \text{H}^+ + \text{HO}_2^-$	$K = 2,4 \cdot 10^{-12}$
Selenico	$\text{H}_2\text{SeO}_4 \rightleftharpoons \text{H}^+ + \text{HSeO}_4^-$	$K_1 = \text{molto grande}$
	$\text{HSeO}_4^- \rightleftharpoons \text{H}^+ + \text{SeO}_4^{2-}$	$K_2 = 1,2 \cdot 10^{-2}$
Selenioso	$\text{H}_2\text{SeO}_3 \rightleftharpoons \text{H}^+ + \text{HSeO}_3^-$	$K_1 = 2,7 \cdot 10^{-3}$
	$\text{HSeO}_3^- \rightleftharpoons \text{H}^+ + \text{SeO}_3^{2-}$	$K_2 = 2,5 \cdot 10^{-7}$
Solfidrico	$\text{H}_2\text{S} \rightleftharpoons \text{H}^+ + \text{HS}^-$	$K_1 = 1,0 \cdot 10^{-7}$
	$\text{HS}^- \rightleftharpoons \text{H}^+ + \text{S}^{2-}$	$K_2 = 1,0 \cdot 10^{-19}$
Solforico	$\text{H}_2\text{SO}_4 \rightleftharpoons \text{H}^+ + \text{HSO}_4^-$	$K_1 = \text{molto grande}$
	$\text{HSO}_4^- \rightleftharpoons \text{H}^+ + \text{SO}_4^{2-}$	$K_2 = 1,2 \cdot 10^{-2}$
Solforoso	$\text{H}_2\text{SO}_3 \rightleftharpoons \text{H}^+ + \text{HSO}_3^-$	$K_1 = 1,2 \cdot 10^{-2}$
	$\text{HSO}_3^- \rightleftharpoons \text{H}^+ + \text{SO}_3^{2-}$	$K_2 = 6,2 \cdot 10^{-8}$

**COSTANTI DI IONIZZAZIONE DI BASI DEBOLI A 25°C**

Nome della base	Formula	K <sub>b</sub>
Ammoniaca	$\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$	$K = 1,8 \cdot 10^{-5}$
Anilina	$\text{C}_6\text{H}_5\text{NH}_2 + \text{H}_2\text{O} \rightleftharpoons \text{C}_6\text{H}_5\text{NH}_3^+ + \text{OH}^-$	$K = 4,0 \cdot 10^{-10}$
Dimetilammina	$(\text{CH}_3)_2\text{NH} + \text{H}_2\text{O} \rightleftharpoons (\text{CH}_3)_2\text{NH}_2^+ + \text{OH}^-$	$K = 7,4 \cdot 10^{-4}$
Etilammina	$\text{C}_2\text{H}_5\text{NH}_2 + \text{H}_2\text{O} \rightleftharpoons \text{C}_2\text{H}_5\text{NH}_3^+ + \text{OH}^-$	$K = 4,3 \cdot 10^{-4}$
Etilendiammina	$\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_3^+ + \text{OH}^-$	$K_1 = 8,5 \cdot 10^{-5}$
	$\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_3^+ + \text{H}_2\text{O} \rightleftharpoons \text{NH}_3\text{CH}_2\text{CH}_2\text{NH}_3^{2+} + \text{OH}^-$	$K_2 = 2,7 \cdot 10^{-8}$
Idrazina	$\text{N}_2\text{H}_4 + \text{H}_2\text{O} \rightleftharpoons \text{N}_2\text{H}_5^+ + \text{OH}^-$	$K_1 = 8,5 \cdot 10^{-7}$
	$\text{N}_2\text{H}_5^+ + \text{H}_2\text{O} \rightleftharpoons \text{N}_2\text{H}_6^{2+} + \text{OH}^-$	$K_2 = 8,9 \cdot 10^{-16}$
Idrossilammina	$\text{NH}_2\text{OH} + \text{H}_2\text{O} \rightleftharpoons \text{NH}_3\text{OH}^+ + \text{OH}^-$	$K = 6,6 \cdot 10^{-9}$
Metilammina	$\text{CH}_3\text{NH}_2 + \text{H}_2\text{O} \rightleftharpoons \text{CH}_3\text{NH}_3^+ + \text{OH}^-$	$K = 5,0 \cdot 10^{-4}$
Piridina	$\text{C}_5\text{H}_5\text{N} + \text{H}_2\text{O} \rightleftharpoons \text{C}_5\text{H}_5\text{NH}^+ + \text{OH}^-$	$K = 1,5 \cdot 10^{-9}$
Trimetilammina	$(\text{CH}_3)_3\text{N} + \text{H}_2\text{O} \rightleftharpoons (\text{CH}_3)_3\text{NH}^+ + \text{OH}^-$	$K = 7,4 \cdot 10^{-5}$