HEAT OF SOLUTION DATA FOR AQUEOUS SOLUTIONS

Some heats of solutions and heats of hydration for dilute solutions in pure water at 15 ºC.

Solute	Products	Heat of solution
EXOTHERMIC		
CH_2O_2(l) (methanoic acid)	H^+(aq)+CHO_2^-(aq)	–0.86 kJ/mol
$C_2H_4O_2$(l) (acetic acid)	H^+(aq)+$C_2H_3O_2^-$(aq)	–1.5 kJ/mol
CH_4O(l) (methanol)	CH_4O(aq)	–0.2 kJ/mol
$CaCl_2$(s)	Ca^{2+}(aq) + $2Cl^-$(aq)	–82.9 kJ/mol
$CaCl_2$(s)	$CaCl_2 \cdot 2H_2O$(aq)	–240 kJ/kg
$Ca(OH)_2$(s)	Ca^{2+}(aq) + $2OH^-$(aq)	–16.2 kJ/kg
CO_2(g)	CO_2(aq)	–19.4 kJ/mol
H_2O_2(l)	H_2O_2(aq)	–3.5 kJ/mol
H_2O(l)	H^+(aq)+OH^-(aq)	–58 kJ/mol
H_2SO_4(l)	$2H^+$(aq)+ SO_4^{2-}(aq)	–96.2 kJ/mol
$MgSO_4$(s)	Mg^{2+}(aq)+ SO_4^{2-}(aq)	–91.2 kJ/mol
HCl(g)	H^+(aq)+Cl^-(aq)	–74.8 kJ/mol
$HClO_4$(l)	H^+(aq)+ClO_4^-(aq)	–88.8 kJ/mol
HNO_3(l)	H^+(aq)+NO_3^-(aq)	–33.3 kJ/mol
KOH(s)	K^+(aq)+OH^-(aq)	–56 kJ/mol
LiBr(s)	Li^+(aq)+Br^-(aq)	–49 kJ/mol
$LiBr \cdot H_2O$(s)	Li^+(aq)+Br^-(aq)	–23 kJ/mol
$LiBr \cdot 2H_2O$(s)	Li^+(aq)+Br^-(aq)	–9 kJ/mol
LiCl(s)	Li^+(aq)+Cl^-(aq)	–37 kJ/mol
LiOH(s)	Li^+(aq)+OH^-(aq)	–23.6 kJ/mol
NaOH(s)	Na^+(aq)+OH^-(aq)	–44.3 kJ/mol
NH_3(g)	NH_3(aq)	–30.5 kJ/mol
O_2(g)	O_2(aq)	–11.7 kJ/mol
SO_2(g)	SO_2(aq)	–39.5 kJ/mol
ENDOTHERMIC		
$C_{12}H_{22}O_{11}$(s) (sugar)	$C_{12}H_{22}O_{11}$(aq)	5.4 kJ/mol
$C_6H_{12}O_6$(s) (glucose)	$C_6H_{12}O_6$(aq)	11 kJ/mol
$C_6H_{12}O_6 \cdot H_2O$(s) (glucose monohydrate)	$C_6H_{12}O_6 \cdot H_2O$(aq)	19 kJ/mol
$CO(NH_2)_2$(s) (urea)	$CO(NH_2)_2$(aq)	15 kJ/mol
KBr(s)	K^+(aq)+Br^-(aq)	20 kJ/mol
KCl(s)	K^+(aq)+Cl^-(aq)	17 kJ/mol
$KClO_3$(s)	K^+(aq)+ClO_3^-(aq)	42 kJ/mol
$KMnO_4$(s)	K^+(aq)+ MnO_4^-(aq)	44 kJ/mol
KNO_3(s)	K^+(aq)+NO_3^-(aq)	35 kJ/mol
$NaC_2H_3O_2 \cdot 3H_2O$(s)	$NaC_2H_3O_2 \cdot 3H_2O$(aq)	150 kJ/kg
NaCl(s)	Na^+(aq)+Cl^-(aq)	3.9 kJ/mol
$NaHCO_3$(s)	Na^+(aq)+HCO_3^-(aq)	16.7 kJ/mol
$NaNO_3$(s)	Na^+(aq)+NO_3^-(aq)	20.4 kJ/mol
NH_4Cl(s)	NH_4^+(aq)+Cl^-(aq)	14.6 kJ/mol
NH_4NO_3(s)	NH_4^+(aq)+NO_3^-(aq)	25.7 kJ/mol
K_2SO_4(s)	$2K^+$(aq)+SO_4^{2-}(aq)	23.8 kJ/mol

ADDITIONAL DATA. When HCl(aq) dissolves in NaOH(aq), forming Na^+(aq)+Cl^-(aq), 57 kJ/mol are

released (–57 kJ/mol of heat of solution).

Many other properties can be found in Solution properties for some special solutions: salt-water, sugar-water, alcohol-water, hydrogen peroxide-water, ammonia-water and carbon dioxide-water.

Back to Solutions