



DEHPA

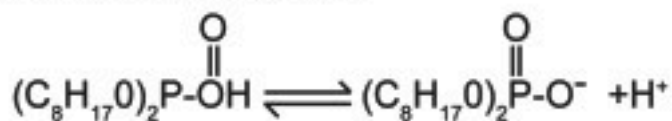
Di (2-ethylhexyl) Phosphoric Acid

Application Information

DEHPA is a highly effective extractant used commercially to recover uranium, vanadium, beryllium, yttrium, cobalt, zinc, rare earths, and other valuable metals. DEHPA, registered trade name for Di (2-ethylhexyl) Phosphoric Acid, may be used alone or in a combination with other synergistic extractants including trioctylphosphine oxide, trbutyl phosphate, and dibutyl butyl phosphonate.

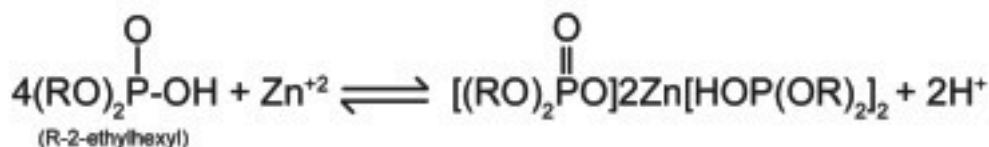
Extraction Mechanism

DEHPA is described as an acidic extractant, which can deprotonate to form an anion.



This hydrophobic anion can chelate a cation from an aqueous phase, the chelate being soluble in the organic phase.

Several studies have suggested that chelation by the DEHPA anion is assisted by coordination with the non-deprotonated species. The extraction of Zn^{+2} is a typical example of DEHPA chelation and coordination.

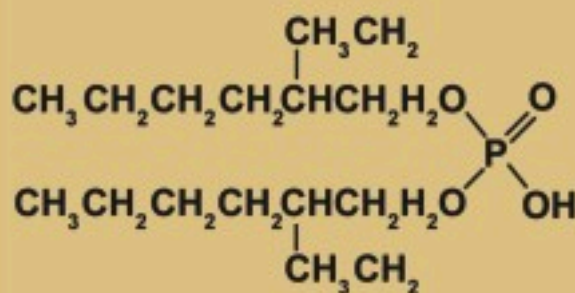


As shown by the equation above, the extraction is an equilibrium, which can shift in either direction dependent on the $[\text{H}^+]$. E.g., as the hydrogen ion concentration decreases, the formation of the DEHPA:Zn complex is favored. Consequently DEHPA is a pH dependent extractant. Yet, the pH alone is not the only consideration. Structure and valence also an important part in extraction.

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Formula – $\text{C}_{16}\text{H}_{35}\text{O}_4\text{P}$
 Molecular Weight – 322.4
 CAS No. 298-07-7



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Product Technical Data

DEHPA

Di (2-ethylhexyl) Phosphoric Acid

DEHPA Extraction of Metals in Nitrate Solutions @ 20°C 50% Extraction pH

pH	Metal
0.15	Sn ²⁺
0.29	Bi ³⁺
0.32	Fe ³⁺
1.17	VO ²⁺
1.42	Zn ²⁺
1.46	Nd ³⁺
1.53	Al ³⁺
1.73	Ce ³⁺
1.90	V ³⁺
1.96	La ³⁺
2.15	Cr ²⁺
2.50	Pb ²⁺
2.82	Mn ²⁺
2.85	Ca ²⁺
2.90	Cu ²⁺
2.98	Cd ²⁺
3.12	Cr ³⁺
3.25	Ag ⁺
3.56	Fe ²⁺
3.70	Co ²⁺
3.81	Mg ²⁺
4.07	Cu ⁺
4.12	Ni ²⁺
4.15	V ²⁺

Typical Properties

Molecular Weight	322.4
Composition (Wt.%)	
Di (2-ethylhexyl) Phosphoric Acid (DEHPA)	95 min
Mono (2-ethylhexyl) Phosphoric Acid (MEHPA)	3 max
Water	.5 max
Phosphorus Content	9.8

Physical Data

Appearance	Clear colorless to pale yellow liquid
Color, APHA	<100
Gardner	<5
Flash Point	
Open Cup, °C	171
Closed Cup	150
Refractive Index, 25°C	1.440-1.444
Density, g/cc	
25°C	0.974
40°C	0.952
60°C	0.937
Viscosity, CPS	
-30°C	1710
0°C	160
20°C	56
40°C	21
100°C	4.4
Melting Point, °C	< -60
Acid Number, mg KOH, °C	174
Autoignition Temp, °C	327
Vapor Pressure, mm @125°C	<1
Solubility in Water, %	<0.01
Water in, %	2.4
pKa	3.95



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