



Cu Ni Co Exaction Reagents

We professionally focus on research and development metal extraction reagents, our major products as below:

1. DZ988N/DZ973N/DZ902 copper solvent extraction reagent: Our Copper extraction reagents have good performance on copper extraction, use our extractant, the purity of cathode copper can over 99.99%.
2. DZ272 nickel cobalt extraction reagent: It can extract low grade Nickel Cobalt ore directly, the leaching step will be saved too much, together with D2EHPA, has good ability to get nickel cobalt from laterite ore.
3. P204 (D2EHPA or HDEHP), this reagent has good ability for removing impurities in the process of extract nickel and cobalt, also be used to extract other metals.

Our R & D team always follow the market needs, not only developed nickel extractants in laterite Nickel ore, Rare earth extractants, Lithium extractants, Vanadium extractants, Beryllium extractants, Rare precious metals (Platinum Iridium Osmium Ruthenium, Palladium and Rhodium) extractants, but also work on Nuclear spent fuel extractants and related extractants in the field of waste battery recycling, always keep on the forefront of industry development.

The "new production base construction" project will be more environment friendly and safer, implement refined management, comprehensively enhance brand power, marketing power, and management efficiency, and build the company into an international leading enterprise in the field of metal extractants.

1. DZ series Copper extraction reagents:



**Our Copper Solvent Extraction Reagent
laboratory test result**



Specification and Performances:

| Item | DZ88 | DZ988N | DZ973N | DZ902 |
|---|------------------|------------------|------------------|------------------|
| Appearance | Brown oil liquid | Brown oil liquid | Brown oil liquid | Amber oil liquid |
| Density (25°C) | 0.91-0.93 | 0.91-0.93 | 0.91-0.93 | 0.95-0.97 |
| Flash temperature | ≥62°C (PMCC) | ≥62°C (PMCC) | ≥62°C (PMCC) | ≥62°C (PMCC) |
| Solubility of copper-carried organic (25°C) | ≥30 g/L Cu | ≥30 g/L Cu | ≥30 g/L Cu | ≥30 g/L Cu |
| Copper saturation capacity 10% (V/V) | 4.8-5.1 g/L Cu | 5.1-5.4 g/L Cu | 5.4-5.7 g/L Cu | 5.6-6.2 g/L Cu |
| Extraction kinetics | ≥90% (60s) | ≥95% (30s) | ≥95% (30s) | ≥95% (30s) |
| Extraction isothermal point (Organic) | ≥3.8 g/L Cu | ≥4.4 g/L Cu | ≥4.7 g/L Cu | ≥4.7 g/L Cu |
| Extraction isothermal point (Aqueous) | ≤2.2 g/L Cu | ≤1.6 g/L Cu | ≤1.3 g/L Cu | ≤1.3 g/L Cu |
| Phase Stripping time of extraction | ≤70s | ≤70s | ≤70s | ≤60s |
| Stripping kinetics | ≥96% (30s) | ≥95% (30s) | ≥95% (30s) | ≥95% (15s) |
| Stripping isothermal point (Organic) | ≤0.6 g/L Cu | ≤1.7 g/L Cu | ≤2.0 g/L Cu | ≤2.3 g/L Cu |
| Stripping isothermal point (Aqueous) | ≥33.2 g/L Cu | ≥32.7 g/L Cu | ≥32.7 g/L Cu | ≥32.4 g/L Cu |
| Stripping Phase time | ≤80s | ≤80s | ≤80s | ≤60s |
| Copper Net Transfer | 3.2 g/L Cu | 2.7 g/L Cu | 2.7 g/L Cu | 2.4 g/L Cu |
| Cu/Fe selectivity | ≥2000 | ≥2000 | ≥2300 | ≥2500 |

Compound copper extraction reagent of Ketoxime and Aldoxime can be used alone or mixed with LIX984N, LIX973N, M5640, M5774, CP-150 and N902 in any ratio.

You can free to add our reagent to your using reagent in any ratio.

In practice, to produce one metric ton cathode copper, the consumption of Aldoxime will more than 10kg, but Compound Aldoxime & Ketoxime (DZ988N) will less than 5kg. The consumption of Compound Aldoxime and Ketoxime reagent will less than single Aldoxime 3-6kg.



Zhengzhou Deyuan Fine Chemicals Co.,ltd

Our engineer is operating a copper extraction plant, the consumption of DZ988N is 2 kg to per ton copper cathode. The purity of copper cathode can reach 99.9982%. The data as below:

| Type | Se | Te | Bi | Cr | Mn | Sb | Cd | As | P | Pb |
|-------|-----------|-----------|-----------|-----------|---------|-----------|-----------|-----------|---------|---------|
| < x > | < 0.00004 | < 0.00010 | < 0.00003 | < 0.00004 | 0.00003 | < 0.00001 | < 0.00001 | < 0.00003 | 0.00030 | 0.00026 |

| Type | S | Sn | Ni | Fe | Si | Zn | Co | Ag | Cu |
|-------|---------|---------|---------|---------|-----------|-----------|---------|-----------|---------|
| < x > | 0.00023 | 0.00037 | 0.00003 | 0.00020 | < 0.00003 | < 0.00003 | 0.00007 | < 0.00001 | 99.9982 |

Laboratory test process:

- Dilute copper extraction reagent: Base the Cu^+ content of PLS (Lixivium liquid), add suitable No.260 solvent oil to dilute the organic. Such as the content of copper is 5 g/L, if we use DZ988N, the copper net transfer is 2.7 g/L, 0.27 g/100ml, $5/0.27=18.5$, so the organic should be dilute to 19%. (Laboratory test usually use 100 ml).
- Pour the prepared organic phase to PLS: according to the volume rate of 1:1, and fully mix it over 3 minutes, then record the time to stand the phase till it is separated, you will know the phase separation time. Then pour out the inorganic solution.
- Pour 180g/L H_2SO_4 to the left organic phase in rate of 2:1-4:1 (V:V), and mix it 3 minutes, then record the back extraction time, we will get pure CuSO_4 . The reverse extracted organic phase can be used again.

If the calculated concentration more than 20%, please change the phase ratio of organic phase to aqueous phase=2:1.

Please click here to view the operation video: <https://www.youtube.com/watch?v=-mQ8iWH1LUo>



How to make sure our reagent is workable in your plant:

Do above laboratory separately to compare the extraction ability, phase separation time and situation with your using reagent; Take your using organic phase, mix with our organic (V/V, 1:1), then do above laboratory test to check the extraction ability, phase separation situation, and confirm whether it has untoward effect.

If above tests all be normal, it means that both reagents can be mixed to use together.

2. DZ272 Low grade Nickel Cobalt ore leaching solvent

- **Chemical name:** Bis (2,4,4-trimethylpentyl) phosphinic acid
- **EINECS No.:** 280-445-7
- **CAS No.:** 83411-71-6
- **Formula:** C₁₆H₃₅O₂P
- **Mol. WT.:** 290.4
- **Performance characteristics:**

| ITEM | | DATA |
|---------------------|--------|------------------|
| Content | | 93.23% |
| Density (25°C) | | 0.92 mg/L |
| Viscosity | (25°C) | 143 cps |
| | (50°C) | 41 cps |
| Solubility in water | | 14 µg/L (PH=2.6) |
| | | 38 µg/L (PH=3.8) |
| Boiling point | | ≥300°C |
| Freezing point | | -31°C |
| Flash point | | 108°C |

- **Character:** Colorless or near colorless liquid, light fruity, faintly acid, nontoxic, there is not corrosion property for most steel plastic container.
- **Usage:** Used for extracting Ni, Co, and rare earth elements of gallium (Ga), molybdenum (Mo), germanium (Ge), thulium (Tm), ytterbium (Yb), lutetium (Lu) etc.



- **Description (Patent No. 201410053573.0)**

The separation coefficient of DZ-272 is more than 20 times of P507 on same condition, it is applied to high content Ni-Co solution, also does not has extraction ability for calcium (Ca), can re-extract iron on the condition of low content sulfuric acid.

DZ-272 can dissolve with fat diluent and aromatic diluent fully, and the stability is good, water-soluble ability is low.

DZ-272 can extract Ni-Co in the system of sulfuric acid and chloride, also can extract rare earth elements of gallium (Ga), molybdenum (Mo), germanium (Ge), thulium (Tm), ytterbium (Yb), lutetium (Lu) etc.

- **Advantage:**

1. The effective component of DZ-272 can over 93%, has good extraction ability, high selectivity, low water-soluble ability, easy to be re-extracted.
2. The extraction step of DZ-272 is less, can save a lot of investment on equipment and hand work, will save much more cost.
3. The price of DZ-272 is lower than competitor very much.



3. P204 Di-(2-ethylhexyl) phosphoric acid (D2EHPA or HDEHP)

CAS: 298-07-7 or 27215-10-7 (both all be right)

IUPAC name: Bis(2-ethylhexyl) hydrogen phosphate.

| ITEM | INDEX |
|------------------|--|
| Appearance | Colorless, transparent, viscous liquid |
| Density (25°C) | 0.973 g/ml |
| Chemical formula | C ₁₆ H ₃₅ O ₄ P |
| Viscosity (25°C) | 3.47mPa·s |
| Flash point | 206°C |
| Ignition point | 233°C |
| Freezing point | -60°C |
| Boiling point | 209°C (1.33kPa) |

Usage:

Di-(2-ethylhexyl)phosphoric acid (D2EHPA or HDEHP) normally be used to remove impurities, then use DZ272 to extract cobalt and magnesium, the balance is nickel.

