# JINAN JIUAN ESTER CHEMICAL CO.,LTD.

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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| Product Name : | DL-Choline Bitartrate | Country of Origin: | China |
| Batch No.: | 20170521 | Quantity: | 800Kg |
| Manufacture time: | 2017.05.17 | Package: | 25Kg/Drum |
| Expiry Date: | 2019.05.16 | Standard: | USP |

| Item | Specification | Results | Test Method |
|---|---|---|---|
| Appearance | White crystalline powder | Conform | Visual |
| Assay (d.s.) | 99.0-100.5% | 99.28% | USP<541> |
| Loss on Drying | NMT 0.5% | 0.32% | USP<731> |
| pH(10% solution): | 3.0-4.0 | 3.53 | USP<791> |
| Residue on Ignition | NMT 0.1% | 0.02% | USP<281> |
| Heavy Metals | NMT 10 ppm | Conform | USP<231> |
| Arsenic | NMT 2ppm | Conform | USP<730> |
| Lead | NMT 0.3ppm | Conform | USP<730> |
| Cdmium | NMT0.2ppm | Conform | USP<730> |
| Mercury | NMT 0.1ppm | Conform | USP<730> |
| 1,4 Dioxane | NMT 10 ppm | Conform | USP |
| Total Amines | NMT 10 ppm | Conform | USP |
| Chromatographic Purity | | | |
| Individual impurities | NMT 0.3% | Conform | USP<39> |
| Total Impurities | NMT2% | Conform | USP<39> |
| Total Plate Count | NMT 1000cfu/g | Conform | USP<61> |
| Yeast and Mold | NMT 100cfu/g | Conform | USP<61> |
| E.coli | Negative | Conform | USP<62> |
| Salmonella | Negative | Conform | USP<62> |
| Staphylococcus | Negative | Conform | USP<62> |
| Particle Size | Thru20 mesh | 100% | USP<786> |

**Conclusion:**
**The test results correspond to USP.**

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