## Vantage Chemical Agents

<table>
<thead>
<tr>
<th>Product name / Chemical name / CAS No.</th>
<th>Properties</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vantage Chemical ALS / SAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Sodium allyl sulfonate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS No. 2495-39-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MF:</strong> C₃H₅SO₃Na</td>
<td>Assay: ≥25% / ≥35%</td>
<td></td>
</tr>
<tr>
<td><strong>Mol. wt:</strong> 144.12</td>
<td>Appearance: Clear colorless to yellowish liquid</td>
<td></td>
</tr>
<tr>
<td><strong>Density (20°C):</strong> 1.20~1.25 g/cm³</td>
<td>PH: 7.0~9.0</td>
<td></td>
</tr>
<tr>
<td><strong>25kpd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance:</strong> White powdery granula</td>
<td></td>
<td></td>
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<tr>
<td><strong>NaCl:</strong> 1.5% max.</td>
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<tr>
<td><strong>Fe:</strong> 0.0003% max.</td>
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<tr>
<td><strong>Na₂SO₃:</strong> 0.2% max.</td>
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<tr>
<td><strong>Moisture:</strong> 3.0% max.</td>
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<tr>
<td><strong>Appearance:</strong> White powdery granula</td>
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</tr>
<tr>
<td><strong>Assay:</strong> 95% min</td>
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<tr>
<td><strong>Vantage Chemical ALS</strong></td>
<td></td>
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<tr>
<td>is an assistant brightener, with features of leveling, improving throwing power and metal ductility</td>
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<tr>
<td><strong>Function:</strong></td>
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<tr>
<td><strong>Vantage Chemical ATP</strong></td>
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<td></td>
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<tr>
<td>(Carboxyethylisothiuronium chloride)</td>
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<td></td>
</tr>
<tr>
<td>CAS No. 5425-78-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MF:</strong> C₃H₇ClN₂O₂S</td>
<td>Assay: ≥98%</td>
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<tr>
<td><strong>Mol. wt:</strong> 184.64446</td>
<td>Appearance: White or yellowish powder</td>
<td></td>
</tr>
<tr>
<td><strong>Assay:</strong> ≥98%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>25kfd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance:</strong> White powder</td>
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<tr>
<td><strong>Assay:</strong> ≥98%</td>
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<td></td>
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<td><strong>A Class I Brightener which is primarily improves tolerance metallic purities, ductility and covering power at low current densities. Suitable in Cu, Ni and Ni-Fe alloy electroplating baths.</strong></td>
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<tr>
<td><strong>Vantage Chemical ATPN</strong></td>
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<tr>
<td>(S-Carboxyethylisothiuronium betaine)</td>
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<tr>
<td>CAS No. 5398-29-8</td>
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</tr>
<tr>
<td><strong>MF:</strong> C₄H₈ClN₂O₂S</td>
<td>Assay: ≥98%</td>
<td></td>
</tr>
<tr>
<td><strong>Mol. wt:</strong> 148.18</td>
<td>Appearance: White powder</td>
<td></td>
</tr>
<tr>
<td><strong>Assay:</strong> ≥98%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>25kfd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance:</strong> White powder</td>
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**Key:**
- **pb:** Paper Bag
- **wb:** Woven Bag
- **fd:** Fibre Drum
- **pd:** Plastic Drum
- **md:** Metal Drum
| VantageChemical BBI (Bis(benzene sulphonyl)-imide) | MF: C12H11O4NS2  
Mol.wt: 297.34  
Appearance: White powder  
Assay: ≥85%, ≥97% | A Class I Brightener dissolved in an Alkali solution the pH must be maintained between 4.5-5 to ensure stable solubility. Maybe be used as co-brightener in combination with Saccharin. It improves leveling, impurities tolerance, deposit brightness and reduction in overall usage of Saccharin. |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CAS No. 2618-96-4</td>
<td>25kfd</td>
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</tbody>
</table>
| VantageChemical BCES (Butynyl Chlorohydinether Sulfonate) | MF: C10H16O10Na2S2  
Mol.wt: 235.11  
Appearance: Clear yellow or red-tea like liquid  
Assay: 25%  
Density g/cm3 (20℃): 1.16~1.20  
PH: 6.0~7.0  
Refractive Index(20℃): 1.3820~1.3900 | Directly used as brightener and weak leveling agent. when using together with ATP, PS, it can help improve brightness at low current region. |
| CAS No. 67874-62-8 | 25kpd | |
| VantageChemical BEO (Butynediol ethoxylate) | MF: C8H14O4  
Mol.wt: 174.20  
Appearance: Clear yellowish to red brown liquid  
Assay: ≥98%  
Density g/cm3 (20℃): 1.11~1.16  
PH: 4.0~7.0  
Refractive Index(20℃): 1.4740~1.4840 | a Class II Brightener with excellent durable brightness characteristic. Formulations incorporating VantageChemical BEO will provide metals exposed to acidic environment with outstanding corrosion resistance, with impurities tolerance in Cu, Fe and Zn. |
| CAS No.1606-85-5 | 25kpd | |
| VantageChemical BMP (Butynediol propoxylate) | MF: C10H18O4  
Mol.wt: 144.17  
Appearance: Clear brown liquid  
Assay: ≥95%  
Density g/cm3 (20℃): 1.07~1.09  
PH: 4.0~7.0  
Refractive Index(20℃): 1.4640~1.4726 | A strong Class II Brightener which produces bright white Ni deposits at low and medium current density region with levelling properties. |
| CAS No. 1606-79-7 | 25kpd | |
| VantageChemical BOZ (Butyne-1,4-diol) | MF: C4H6O2  
Mol.wt: 86.09  
Appearance: White crystal  
Content: ≥98.0%  
Aldehyde (methyl aldehyde): 0.5% max  
Melting point: 42-50℃ | A strong Class II Brightener with corrosion inhibition properties and excellent brightening and levelling performance. |
| CAS No: 110-65-6 | 25kmd | |
| **VantageChemical DEP**  
(1-Diethylamino-2-propyne)  
CAS No. 4079-68-9 | **20kpd** | **MF:** C7H13N  
**Mol.wt:** 111.18  
**Appearance:** Clear colorless or yellowish liquid  
**Assay:** ≥98%  
**Density g/cm³ (20°C):** 0.75~0.85  
**PH:** ≥7  
**Refractive Index (20°C):** 1.4245~1.4467 | **VantageChemical DEP** is a fast brightening and leveling agent with efficiencies at the low current density range. As a Class II Brightener advantageous synergies are created in combination with other Class I or II brightener intermediates. |
| **VantageChemical EHS**  
(Sodium Hydroxy Ethylene Sulfonate)  
CAS No.1562-00-1 | **25kpd** | **MF:** C2H5NaO3S  
**Mol.wt:**  | **Appearance:** Colorless to Yellowish liquid  
**Assay:** ≥45%  
**PH:** 2~4  
**Solubility in water:** any ratio ( @20°C)  
**Density:** 1.31~1.34g/cm³ | **VantageChemical EHS** serves as an auxiliary brightening agent to improve deposit, metal ductility and as a dispersing agent for a homogenous brightening formulation. |
| **VantageChemical HBOPS-Na**  
(3-(Butynediol) sulfopropyl ether, monosodium salt)  
CAS No. 90268-78-3 | **25kpd** | **MF:** C7H11NaO5S  
**Mol.wt.:** 230.22  
**Appearance:** Yellow-brown liquid  
**Assay:** 50%  
**Density g/cm³ (20°C):** 1.11~1.16  
**PH:** 10.5~11.5  
**Refractive Index (20°C):** 1.4740~1.4840 | It is an alkyne-ether compound. In watts bright nickel plating, usually used as leveling agent, also as second brightener. It is combined with saccharin, PPS, PPS-OH and wetting agent etc. when combining with PPS and liquid POPS, it may obtain optimal result. |
| **VantageChemical HD**  
(3-hexyne-2,5-diol)  
CAS No.3031-66-1 | **25Kmd** | **MF:** C6H10O2  
**Mol.wt.:** 114.14  
**Appearance:** light yellow liquid  
**Assay :** ≥80% | Used in pharmaceutical intermediate, brightener and intermediate |
| **VantageChemical HD-M**  
(2.5-dimethyl-2-hexynediol)  
CAS No. 142-30-3 | **25Kfd** | **MF:** C8H14O2  
**Mol.wt.:** 142.20  
**Appearance:** White solid  
**Assay:**≥99% | Intermediate for Semi-bright and bright nickel plating |
| **VantageChemical MPA**  
(1,1-Dimethyl-2-propynyl-1-amine)  
CAS No. 2978-58-7 | **MF:** C5H9N  
**Mol.wt:** 83.13  
**Appearance:** colorless to yellowish liquid  
**Assay:** 89-91% | **25Kmd**  
VantageChemical MPA an outstanding Class II brightener is highly essential in formulating superior brightener additives meant for use in Ni plating baths. VantageChemical MPA features fast brightening and levelling benefits and is ideal effectively in low current density areas. Synergistic combinations with other Class I and Class II brighteners have resulted in significant advantages. |
| **VantageChemical PA**  
(Propargyl alcohol)  
CAS No. 107-19-7 | **MF:** C3H4O  
**Mol.wt:** 56.06  
**Appearance:** clear colorless to yellowish liquid  
**Assay:** ≥99.5%  
**Moisture:** 0.2% max.  
**APHA:** 40# max  
**Formaldehyde:** 0.5% max | **25Kmd**  
A class II Brightener intermediate specific for brightness and levelling characteristics. |
| **VantageChemical PABS**  
(Diethylaminopropyne formate)  
CAS No. 125678-52-6 | **MF:** C8H15NO2  
**Mol.wt:** 157.2  
**Appearance:** Clear yellowish liquid  
**Assay:** ≥70%  
**Density g/cm3 (20°C):** 1.02~1.06  
**PH:** 4.5~5.8  
**Refractive Index(20°C):** 1.4190~1.4320 | **25Kpd**  
Leveling agent, brightener for nickel plating |
| **VantageChemical PAP**  
(Propargyl alcohol propoxylate)  
CAS No. 3973-17-9 | **MF:** C6H10O2  
**Mol.wt:** 114.14  
**Appearance:** Clear colorless to yellowish liquid  
**Assay:** ≥98%  
**Density g/cm3 (20°C):** 0.97~0.98  
**PH:** 6.0~7.5  
**Refractive Index(20°C):** 1.4430~1.4455 | **25Kpd**  
Leveling agent, brightener for nickel plating |
| **VantageChemical PME**  
(Propynol ethoxylate)  
CAS No. 3973-18-0 | **25kpd** | MF: C5H8O2  
Mol.wt: 100.12  
Appearance: Clear colorless to yellowish liquid  
Assay: ≥98%  
Density (20°C): 1.01~1.04 g/cm³  
PH: 6.0~7.0  
Refractive Index(20°C): 1.4465~1.4500 | This Class II brightener it is widely used in conjunction with other C I & C II brightener aids. It has lower vapor pressure than the Propoxylated version PAP. |
|---|---|---|---|
| **VantageChemical PN**  
(Hydroxymethanesulfonic acid, monosodium salt)  
CAS No. 870-72-4 | **25kpd** | MF: CH3NaO4S  
Mol.wt: 134.08  
Appearance: Clear colorless liquid  
Assay: 28%  
Density g/cm³ (20°C): 1.20~1.25  
PH: ≥7  
Refractive Index(20°C): 1.3700~1.3830 | VantageChemical PN is a highly effective and efficient complexing agent for Cupric, Zn & Pb with co-deposition with Ni ions. |
| **VantageChemical POPDH**  
(Propargyl-oxo-propane-2, 3-dihydroxy)  
CAS No. 13580-38-6 | **25kpd** | MF: C6H10O3  
Mol.wt: 130.14  
Appearance: Clear yellow liquid  
Assay: 50%  
Density g/cm³ (20°C): 1.06~1.11  
PH: 1.0~2.0  
Refractive Index(20°C): 1.3900~1.4100 | Used with derivative of alkyne-alcohol, synergistic brightness to enhance leveling and filling up ability at low current region. |
| **VantageChemical POPS**  
(Propargyl-3-sulfopropyl ether, sodium salt)  
CAS No. 30290-53-0 | **25kpd** | MF: C6H9NaO4S  
Mol.wt: 200.19  
Appearance: Light yellow liquid  
Assay: about 45% | Brightener and leveling agent, good result can be obtained when using together with PPS, POPS, HBOPS-Na, it can improve leveling ability at high current region. |
| **VantageChemical PPS**  
( Pyridinium propyl sulfobetaine)  
CAS No. 15471-17-7 | **25Kfd** | MF: C8H11NO3S  
Mol.wt: 201.24  
Appearance: White crystalline powder  
Assay: ≥98%  
PH: 2.5~6.0 (50% aqueous solution)  
Addition level: 50~150mg/l  
Consumption: 10g/ KAH | VantageChemical PPS exhibits excellent levelling properties levelling improvements even in extremely thin metal deposits with brilliant finish in medium-high current density are attained. |
| **VantageChemical PPS-OH**  
(Pyridinium hydroxy propyl sulfobetaine) | MF: C8H11NO4S  
Mol.wt: 217.24  
1. Assay: ≥40%, ≥45%  
Appearance: Clear colorless to yellowish liquid  
Density (20℃): 1.20~1.27g/cm³  
PH: 3.0~5.0  
Refractive Index(20℃): 1.4200~1.4500 | High leveling agent for nickel plating, (special suitable for high and medium region of current density) |
| **VantageChemical PS**  
(Propynesulfonic acid sodium salt) | MF: C3H3NaO3S  
Mol.wt: 142.11  
Appearance: Clear yellowish liquid  
Assay: 20%, 25%  
Density g/cm³ (20℃): 1.21~1.29  
PH: 2.0~4.0  
Refractive Index(20℃): 1.3900~1.3990 | VantageChemical PS displays brightness improvement, throwing power and levelling at low current densities. VantageChemical PS also has high impurities tolerance. |
| **VantageChemical SSO3**  
(Apparent: Clear colorless liquid  
Assay: ≥55%  
Density g/cm³ (20℃): 1.29~1.35  
PH: 3.0~5.0  
Refractive Index(20℃): 1.3975~1.4088 | Impurities tolerance agent, it can improve covering power at low current region. for nickel plating |
| **VantageChemical SVS**  
(Sodium Vinlylsulfonate) | MF: C2H3SO3Na  
Mol.wt: 130.09  
Appearance: Clear yellowish liquid  
Solid ≤35%  
Content: 25%-26%  
Color(APHA) ≤200  
pH : 8-12  
NaCl : 3%-4%  
Filterablele matter. ≤0.1% | **VantageChemical SVS** is used for Brightener, leveling agent, dispersant, impurities tolerance agent for low current region for nickel plating |
| **VantageChemical TCA**  
| (Chloral hydrate)  
| CAS No. 302-17-0  
| 25Kfd | MF: C2H3Cl3O2  
| Mol.wt: 165.4  
| Appearance: white crystal  
| Assay: ≥99%  
| PH: 4.0~6.0  
| Chloride: ≤0.01%  
| Residue on ignition: ≤0.1% | VantageChemical TCA used as semi-brightener in nickel plating |

| **VantageChemical TC-DEP 50**  
| (N,N-Diethyl-2-propyneammonium sulfate)  
| CAS No. 84779-61-3  
| 20Kpd | MF: C14H28N2SO4  
| Mol.wt: 320  
| Appearance: Clear colorless or yellowish liquid  
| Assay: 49-51%  
| Density g/cm³ (20°C): 1.085-1.095  
| PH(20°C): 3-4 | VantageChemical TC-DEP 50 a Class II Brightener is a 50% aqueous and acidified solution with outstanding brightness and levelling feature. |

| **VantageChemical TC-EHS**  
| (2-Ethylhexylsulphate, sodium salt)  
| CAS No. 126-92-1  
| 25Kpd | MF: C8H17O4SNa  
| Mol.wt: 232.27  
| Appearance: clear yellowish liquid  
| Assay: 40% min | VantageChemical TC-EHS is a fatty alcohol ethoxylate most suited additive for deaerating and wetting in Ni plating. It provides anti-pitting and surface conditioning properties. |