**Product Description**

We company employed a specific aggregation technology to prepare the low molecular weight polymer, with narrow molecular weight distribution and strong ability to scale inhibition, it is far better than the common similar technology products. In addition, a kind of sodium polyacrylate-based scale inhibitor and dispersant (PAAS) was developed. Compared with the liquid product, the product can save the packing and transportation cost, and effectively solve the potential safety hazard trouble in the process of transportation and storage. PAAS can effectively control the fouling caused by carbonate, sulfate and iron oxide in water. It is widely used in petrochemical, electric power, metallurgy, chemical fertilizer as well as boiler water treatment, ceramics and paper dispersion, etc.

**Technical Indicators**

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale Inhibitor</th>
<th>Dispersant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid powder</td>
<td>Solid powder</td>
</tr>
<tr>
<td>Available content, %</td>
<td>&gt;99</td>
<td>&gt;99</td>
</tr>
<tr>
<td>Water, %</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>pH (1% aqueous solution)</td>
<td>6~9</td>
<td>6~9</td>
</tr>
<tr>
<td>MW distribution factor</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Relative molecular weight</td>
<td>1000~1700</td>
<td>3000~5000</td>
</tr>
</tbody>
</table>

**Distinguishing Features**

Sodium polyacrylate is a water soluble straight chain polymer, named as PAAS, and the structural formula is . It possess a series of excellent features such as strong heat resistance, high temperature resistance (~300°C), good viscosity and quality stability and so on. Ranged a broad molecular weight from hundreds to tens of millions for sodium polyacrylate, there is a very close relationship between the molecular weight of sodium polyacrylate and its properties, such as the anti-scaling agent: molecular weight of 700~1700; dispersant: molecular weight of 2000~10000; thickeners, high molecular weight of 104~106; flocculants: high molecular weight of 106~107; and water absorbers: molecular weight of >107.

It always happens to the problem of inorganic salt deposition during the applied process of industrial circulating water, and the commonly method is use the water treatment agent to inhibit the formation of scale. The low molecular weight sodium polyacrylate, with excellent water-solubility and strong polar, can combine with Ca^{2+}, Mg^{2+} and other metal ions through the effects of chelating, achieving the goal of dispersion, based on which, the sodium polyacrylate is an commonly water treatment scale inhibitor dispersing agent. For example, low molecular weight sodium polyacrylate has a good scale inhibition and dispersion effect on calcium ion, which can improve the tolerance of calcium ion. When Ca^{2+} concentration reaches a certain limit, there will be formed, the sodium polyacrylate can affect the formation of grain, lead to the porous structure, and effectively prevent the formation of calcium carbonate and other particles.

The molecular weight distribution of sodium polyacrylate has a great influence on its scale inhibition performance. With the decrease of the molecular weight of sodium polyacrylate, the scale inhibition performance is gradually enhanced. As a calcium carbonate scale inhibitor, the best relative molecular weight distribution range is 1000~1700, typically, the scale inhibition rate of calcium carbonate can up to 80% when the relative molecular weight is less than 1700.

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**QUALITY, VALUE, RESPONSIBILITY**

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Different molecular amount and distribution of sodium polyacrylate also has great difference to the calcium carbonate dispersing effect, because the PAA ionization in water out lots of negative ions, these ions adsorbed on the surface of calcium carbonate, with the same charge, mutual exclusion, prevent flocculation, and to achieve the purpose of dispersion stability. However, not the higher PAA molecular weight, the greater dispersion effect, for the fact that when the molecular chain length up to a certain extent, the PAA plays a bridging role, and a molecule can adsorb more particles, also each particle is adsorbed by more long chains as a result to constitute a reticular structure and easy to cause the flocculation. Therefore, PAAS as a dispersant has the best molecular weight. By the transmittance scanning and stability analysis, the relative molecular weight of 3000~400 for the PAA exhibited the best dispersion of calcium carbonate.

The relative molecular weight of sodium polyacrylate also has a great influence on the stability of Zn2+, with the relative molecular weight of 5000~6000, the Zn2+ presented the best stability, and the concentration of Zn2+ is higher than 85%.

Sodium polyacrylate is the most effective non phosphorus detergent. Practices has proved that sodium polyacrylate has good dispersion effect on dirt granules and calcium soap scum, meanwhile, it also can chelate with some metal ions as a result to become the research hotpot on the basis of the conditions that the voice of non-phosphorus additives requirement getting louder and louder. What is more, its perfect characteristics such as non-toxicity, non-pollution to the environment, completely avoid the drawbacks of tripolyphosphate, superior ability to the washing effect within the same

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quality as compared to tripolyphosphate, and high economic benefits, more importantly, with the sodium polyacrylate as
the detergent reduced the waste water discharge and environmental pollution, made it becomes the ideal candidate for
detergent auxiliary. Sodium polyacrylate with low molecular weight has a critical value to inhibit the precipitation of
calcium carbonate, which is an obvious advantages compared with other detergent additives.

As the clay dispersing agent, the sodium polyacrylate possess excellent clay dispersion effect, and the dispersion
efficiency can reach 93%. Sodium polyacrylate also used in wall polishing putty with playing a good dispersing effect.

The low molecular weight sodium polyacrylate possess good water reducing effect and can as the high efficiency water
reducing agent. The reason are as follows: the sodium polyacrylate electrostatic and steric hindrance has relatively stable
mechanism, leading to the charged particle aggregates adsorbed on the solid particles in the mud; sodium ion can be
gathered in the clay particles, increasing the thickness of the diffusion layer. At the same time, magnesium, calcium ion is
displaced, so the potential greatly increased. Furthermore, the electrostatic repulsion of micelle increased significantly;
polymer molecular structure itself has a steric hindrance, and block the particles nearby, promoting the dispersion effect
at the same time.

Moderate sodium polyacrylate can facilitate the cement better dispersed in the water. In the cement, particles exist in
molecular attraction with each other, and easy to agglomerate to become flocculent. During the flocculent process, there
will be part of the water packaged in the flocculent, the hydrophilic pointing to the aqueous solution, and the same charge
exposed in the cement particles in the outer table; the sodium polyacrylate can increase the electrostatic repulsion
between the particles, which is favorable for particles dispersed, thereby reducing blended cement demand for water.

The ceramic industry is often use sodium polyacrylate with a series of reasons, such as the sodium polyacrylate molecules
have longer chain, the chain with a large number of charges, the charge exists between the electrostatic repulsion, which
can make the particles stable, and reduce the viscosity of the slurry, effectively hinder the agglomeration of particles.
Ceramics in the shape of the mold is easy to damage, then adding moderate amount of sodium polyacrylate into the mud,
can greatly improve the rough strength and the product quality. Experiments show that the sodium polyacrylate is a good
reducing agent in the process of ceramic production.

### Usage

The product can be used alone or in combination with other drugs, and the performance is the same as that of PAAS.

### Packing and Storage

This product is plastic bag packaging, each bag 25 kg or 50 kg, or according to the customer demand. Store in a cool
place, wanted time is 3 years.

### Safety and Protection

Although this product is non-toxic, tasteless, non flammable and non explosive, pay attention to labor protection under
the operation; avoid contact with skin, eyes, etc., with a large amount of clean water rinse in case of touching with it.

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