Technical Data Sheet: KELA Copper Chromite Catalyst

1.0 Product Description

In modern chemical manufacturing, the selection of a high-performance catalyst is a strategic decision that directly impacts process efficiency, product quality, and operational economics. KELA Copper Chromite Catalyst is a highly efficient copper chromite ($CuCr_2O_4$) spinel catalyst engineered to meet the demanding requirements of a wide range of industrial applications, including hydrogenation, dehydrogenation, hydrogenolysis, and environmental catalysis. Its superior performance in delivering high activity, exceptional selectivity, and robust stability is the direct result of a proprietary manufacturing process that enables precise control over the catalyst's key physical and chemical properties, ensuring consistent, reliable results across diverse chemical processes.

2.0 Key Features & Commercial Benefits

The advanced technical attributes of KELA Copper Chromite Catalyst translate directly into significant operational and economic advantages for our customers.

- **High Catalytic Activity:** Achieves high conversion rates under demanding process conditions, including elevated temperatures and pressures. This leads to increased production throughput, optimized reactor utilization, and greater overall process efficiency.
- **Exceptional Selectivity:** Precisely targets desired functional groups while minimizing unwanted side reactions. For example, in the hydrogenation of aldehydes or the hydrogenolysis of glycerol to propylene glycol, high selectivity results in higher-purity products, simplifies downstream separation, and reduces purification costs.
- **Robust Stability & Long Lifetime:** Engineered as a rugged catalyst with excellent resistance to deactivation, particularly in modern low-sulfur process streams. Its stable structure supports a long operational lifespan and offers potential for regeneration, which translates to lower catalyst replacement costs, reduced process downtime, and enhanced operational reliability.
- **Application Versatility:** Demonstrates proven efficacy across a broad spectrum of chemical transformations, including hydrogenation, dehydrogenation, hydrogenolysis, and the catalytic oxidation of pollutants. This versatility makes KELA Copper Chromite Catalyst a multi-purpose solution, simplifying catalyst inventory and procurement for facilities with diverse production needs.

This optimal balance of activity, selectivity, and stability is achieved through precise control of the catalyst's fundamental physical and chemical properties, as detailed below.

3.0 Typical Physical & Chemical Properties

The superior performance of KELA Copper Chromite Catalyst is rooted in its tightly controlled physical and chemical properties. While the table below lists our typical specifications, our

proprietary manufacturing process allows us to tailor these parameters to meet specific customer process requirements.

Property	Claim in Table
Appearance	Black powder
Chemical Formula	$CuCr_2O_4$
CAS Number	*12053-18-8*
Crystal Structure	Spinel
Density	5.4 g/cm³
BET Surface Area	10-20 m²/g
Pore Volume	0.15 - 0.4 cm³/g
Average Particle Size	1 - 5 μm
Cu Content	27.46 wt%
Cr Content	44.92 wt%
O Content	27.62 wt%
pH (10% slurry)	6 – 8
Solubility in Water	< 0.7%

The following section details how these precisely engineered properties translate into proven, high-yield performance across key industrial applications.

4.0 Recommended Applications & Operating Conditions

KELA Copper Chromite Catalyst is the catalyst of choice for a range of high-value industrial transformations, from upgrading bio-renewable feedstocks into valuable chemicals to producing essential intermediates for the pharmaceutical and fragrance industries with exceptional precision.

4.1 Hydrogenolysis of Esters and Glycerol

The catalyst is highly effective in converting bio-renewable feedstocks and oleochemicals into valuable products. Key applications include the hydrogenolysis of fatty esters to produce fatty alcohols and the conversion of glycerol (a biodiesel byproduct) into propylene glycol.

- **Fatty Ester to Fatty Alcohol:**
  - *Typical Temperature:* 250–300 °C
  - *Typical Pressure:* 25–30 MPa
- **Glycerol to Propylene Glycol:**
  - *Typical Temperature:* 200–210 °C
  - *Typical Pressure:* 1.4–4.15 MPa
  - *Performance Note:* Achieves high glycerol conversion (>51-54%) and excellent selectivity to propylene glycol (>88-96%) under moderate conditions.

4.2 Dehydrogenation of Alcohols

KELA Copper Chromite Catalyst serves as a highly selective catalyst for the dehydrogenation of alcohols to produce aldehydes and ketones, which are critical intermediates in the fine chemicals, fragrance, and pharmaceutical industries.

- **Isoborneol to Camphor:**
  - *Typical Temperature:* 200–300 °C
  - *Typical Pressure:* 0.5–1.5 MPa (Liquid Phase)
  - *Performance Note:* This process achieves high conversion with selectivity to camphor approaching 100%, demonstrating the catalyst's precision and efficiency.

4.3 Selective Hydrogenation

The catalyst excels at selectively hydrogenating specific functional groups while leaving others intact—a critical function in multi-step organic synthesis for pharmaceuticals, fragrances, and specialty chemicals.

- **Aldehydes to Alcohols (e.g., Furfural to Furfuryl Alcohol):**
  - *Typical Temperature:* ~150 °C
  - *Key Feature:* Provides high yields of the target alcohol while preventing over-reduction or hydrogenolysis of the product, ensuring maximum product value.

To ensure that KELA Copper Chromite Catalyst delivers this high level of performance consistently and safely throughout its long operational life, we recommend the following handling and storage protocols.

5.0 Handling and Storage

KELA Copper Chromite Catalyst should be handled in a well-ventilated area using appropriate personal protective equipment (PPE), including gloves, safety glasses, and respiratory protection to avoid dust inhalation. Store the material in its original, tightly sealed packaging in a cool, dry place away from moisture and incompatible materials. For complete safety, handling, and disposal information, please consult the Safety Data Sheet (SDS) for this product.

6.0 Disclaimer

The information provided in this Technical Data Sheet is based on the current knowledge and experience of Kela Materials Co., Ltd. and is intended for informational purposes only. It is not to be construed as a binding specification or warranty, expressed or implied. The data presented represents typical properties and should not be used for specification purposes without prior consultation. The user is solely responsible for determining the suitability of this product for their specific application and must conduct their own tests to validate performance under their operating conditions. Kela Materials Co., Ltd. assumes no liability for any loss or damage that may occur from the use of this information.

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