

球形钨催化剂

1. 产品特性

1.1 孔结构优良、活性高、寿命长

催化剂孔结构良好，具有大孔容、大比表面积、孔径集中等优点。催化剂活性高，同比其它催化剂高 20-40%。

1.2 抗压强度高、水热稳定性好

载体制备采用油柱成型工艺，而非挤压、滚动等外力成型，因此载体结构稳固，具有较强的抗压强度，因此催化剂使用寿命长。。

1.3 产品质量稳定、纯度高

油柱成型工艺操作便捷，因此不同批次间产品质量稳定。使用高纯铝粉作为原料，因此产品纯度高。

2. 产品性能

项目名称	具体指标
生产能力	APC-Q-1S 型 $\geq 6.5 \text{ kg}(100\%)\text{H}_2\text{O}_2/(\text{kg CAT d})$ LDHA-1 型 $\geq 10.0 \text{ kg}(100\%)\text{H}_2\text{O}_2/(\text{kg CAT d})$
蒽醌消耗	前 3 个月 $\leq 1.0\text{kg}/\text{t}(27.5\%)\text{H}_2\text{O}_2$; 3-12 个月 $\leq 0.7\text{kg}/\text{t}(27.5\%)\text{H}_2\text{O}_2$; 12 个月后 $\leq 0.45\text{kg}/\text{t}(27.5\%)\text{H}_2\text{O}_2$
再生周期	≥ 6 个月，再生后活性恢复 $\geq 98\%$
催化剂消耗	$\leq 0.03\text{kg CAT}/\text{t}(27.5\%)\text{H}_2\text{O}_2$
使用寿命	≥ 4 年
初始小试活性	APC-Q-1S 型 $\geq 11.0\text{g}/\text{L}$ LDHA-1 型 $\geq 14.0 \text{ g}/\text{L}$
选择性	$\geq 99\%$
床压降	0.02~0.03 MPa/m
磨耗率	$\leq 0.05\%$
铁含量	$\leq 0.05\%$
Al ₂ O ₃ 含量	$\geq 95\%$
晶型	γ or $\delta+\theta$ (根据用途可调整)
孔结构	孔容 $\geq 0.6 \text{ mL}/\text{g}$ ，比表面积 $\geq 80\text{m}^2/\text{g}$
最佳使用条件	(1)工作液组分：总蒽醌含量 $\geq 160\text{g}/\text{L}$ (2)溶剂体积比：3.0:1~3.5:1 (3)床喷淋密度： $\geq 100\text{m}^3/(\text{m}^2 \text{ h})$ (4)床温：40~75℃ (5)床压：0.10 ~ 0.35MPa
包装运输	20kg 内衬两层塑料袋，纸袋桶或铁桶包装，注意防潮

3. 生产工艺

以高纯铝粉为原料制备铝溶胶，加入胶凝剂后经油柱成型、老化、烘干和焙烧制得球形活性氧化铝载体。将活性组分负载于上述载体制得催化剂。

4. 生产规模：400 吨/年

5. 产品用途

广泛用于过氧化氢生产中蒽醌加氢以及脱硫、烯烃除炔、气体净化等化工领域。

6. 产品规格

APC-Q-1S 型

项目名称	指标
执行标准	Q/LMY 127-2018
外观	棕色球形颗粒
钪质量分数，%	0.30±0.01
堆积密度，kg/L	0.50~0.58
抗压碎强度 N	≥ 38
颗粒分数(2.0~3.0 mm)，%	≥ 95

LDHA-1 型

项目名称	指标
执行标准	Q/LMY 127-2018
外观	棕色球形颗粒
钪质量分数，%	0.30±0.01
堆积密度，kg/L	0.38~0.48
抗压碎强度 N	≥ 38
颗粒分数(2.2~3.2 mm)，%	≥ 95

Spherical Pd/Al₂O₃ Catalyst

1 Product characteristics:

1.1 Fine pore structure, high activity

The catalyst has good pore structure and advantages like large pore volume and specific surface area, narrow pore diameter distribution. The catalytic activity is 20-40% higher than other commercial catalysts.

1.2 High strength and long working life

Since oil-drop method, instead of extrusion or rolling, is employed to produce carrier alumina, the catalysts better structure, have high strength and therefore long working life.

1.3 Stable manufacturing, and high purity

Oil-drop method is easy for workers to operate, contributing to stable manufacturing. Ultra-pure aluminum powder is employed to produce alumina sol, so high purity of end products is guaranteed.

2. Catalyst performance

Item	Performance
H ₂ O ₂ production	APC-Q-1S: $\geq 6.5 \text{ kg}(100\%)\text{H}_2\text{O}_2/(\text{kg CAT d})$ LDHA-1: $\geq 10.0 \text{ kg}(100\%)\text{H}_2\text{O}_2/(\text{kg CAT d})$
Anthraquinone consumption	$\leq 1.0\text{kg}/\text{t}(27.5\%) \text{ H}_2\text{O}_2$ (during the first 3 months) ; $\leq 0.7\text{kg}/\text{t}(27.5\%) \text{ H}_2\text{O}_2$ (3-12months) ; $\leq 0.45\text{kg}/\text{t}(27.5\%) \text{ H}_2\text{O}_2$ (after 12 months)
Regeneration cycle	≥ 6 months $\geq 98\%$ activity can be recovered after regeneration
Catalysts consumption	$\leq 0.03\text{kg CAT}/\text{t}(27.5\%)\text{H}_2\text{O}_2$
Working life	≥ 4 years
Initial experimental activity	APC-Q-1S: $\geq 11.0\text{g}/\text{L}$ LDHA-1: $\geq 14.0 \text{ g}/\text{L}$
Selectivity	$\geq 99\%$
Pressure drop	$\leq 0.02\sim 0.03 \text{ MPa}/\text{m}$
Attrition loss	≤ 0.05
Iron content	≤ 0.05
Al ₂ O ₃ content	$\geq 95\%$
Crystal structure	γ or $\delta+\theta$ (tunable)
Pore structure	Pore volume $\geq 0.6 \text{ mL}/\text{g}$; Specific surface area $\geq 80 \text{ m}^2/\text{g}$
Best using condition	(1) total anthraquinone concentration $\geq 160\text{g}/\text{L}$ (2) solvent ratio: 3.0:1~3.5:1 (3) volumetric flux of working solution $\geq 100\text{m}^3/(\text{m}^2 \text{ h})$ (4) bed temperature: 40~75°C (5) bed pressure: 0.10 ~ 0.35MPa
Package	20kg per carton bucket or iron bucket, lined with two plastic bags. Keep away from moisture.

3. Manufacturing process

Ultra-pure aluminum powder is used as raw material to synthesize aluminum sol. After that the gelling agent is added into the sol. The mixture is then dispersed into the column filled with hot oil to form gel spheres. The gel spheres are subsequently aged, dried and calcinated, and spherical activated alumina is produced. Finally, palladium is loaded on the said alumina to get spherical Pd/Al₂O₃ catalysts.

4. Catalyst production: 400t/a

5. Usage

The spherical Pd/Al₂O₃ catalyst is widely used in the anthraquinone process as the hydrogenation catalyst to manufacture hydrogen peroxide. Besides, it is also used in desulphurization, olefin de-acetylene, gas purification and other chemical industries.

6. Specification:

APC-Q-1S

Item Name	APC-Q-1S
Standard	Q/LMY 127-2018
Appearance	Brown spherical particle
Palladium Mass Fraction, %	0.30±0.01
Bulk Density, kg/L	0.50~0.58
Crushing strength N	≥ 38
Diameter distribution (2.0~3.0mm), %	≥ 95

LDHA-1

Item Name	LDHA-1
Standard	Q/LMY 127-2018
Appearance	Brown spherical particle
Palladium Mass Fraction, %	0.30±0.01
Bulk Density, kg/L	0.38~0.48
Crushing strength N	≥ 38
Diameter distribution (2.2~3.2mm), %	≥ 95