Hydroxylation of Phenol to Hydroquinone & Catechol

Hydroquinone (HQ) is a very important intermediate for synthesis of antioxidants and antiozonants. Hydroquinone is also used as an intermediate and as inhibitor to stabilize monomers. It is also used as stabilizers for paints, varnishes, motor oils, and fuels; and as antioxidants for industrial fats and oils. Hydroquinone is used in skin lightening creams, and as a coupler in oxidative hair dyes.

Heterogeneous Alumina based as well as Zeolite based catalysts are known to be selective towards Hydroxylation of Phenol to Hydroquinone and Catechol.

Catalytic process: PROCAT™ ZT0P

Phenol is hydoxylated by using $\text{H}_2\text{O}_2$ reagent in the presence of a heterogeneous acidic catalyst in a slurry reactor. The advantage over conventional process is that it does not need any mineral acid or alkali for hydroxylation and therefore the process does not generate any waste and hence, environmentally friendly and really cost effective.

Phenol is hydroxylated with $\text{H}_2\text{O}_2$ over PROCAT™ ZT0P catalyst in a slurry reactor giving Hydroquinone as a major component along with Catechol. The Phenol conversion is more than 60% and ratio of Catechol to hydroquinone selectivity is 1:1.3. Thus showing higher selectivity towards Hydroquinone as compared to that reported in literature.

The deactivated catalyst is regenerated by suitable procedure. The regenerated catalyst is further tested for more number of cycles and found to give almost similar level of conversions & selectivity as that of the fresh catalyst.

CATALYST FORM

PROCAT™ ZT0P catalysts can be made available in various forms, such as powders, extrudes, pellets and spheres.

PACKAGING

- The catalyst is available in 25 and 50 kg packs in HDPE drums.
- For laboratory evaluation the catalyst is supplied in 100 g to 1 kg scale in small containers.

All data are based on PROCAT standard test methods, and all test methods are available on request.

We are working to develop highly selective catalysts and catalytic processes for various reactions such as alkylation, acylation, oxidation, hydroxylation, isomerization, nitration etc. The main focus of the organization is to work in collaboration with customers as their ‘partners in development’ and make available these catalysts in commercial scale to help replace the conventional non-catalytic polluting processes with environmentally clean and more efficient processes.

SALES AND TECHNICAL SUPPORT

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