Ultra-Easy, Efficient Process for producing Pillar-5-quinone (P[5]Q), with applications in Li-ion Batteries and Organic Synthesis

EXECUTIVE SUMMARY

A straightforward, easy and chromatography-free process for producing pillar-5-quinone (a cyclic pentaquinone with very interesting electronic and molecular properties and with applications in sensors, Li-ion batteries, etc.) using readily available starting materials.

BACKGROUND

Pillar-5-arenes, as a class of molecules, have been attracting enormous interest due to their molecular structure (deep *pi*-encircled internal cavity capable of accommodating various guest molecules) and their possible applications in various domains. Pillar-5-quinone is a particularly exciting molecule within this class, thus leading to enormous interest among organic chemists and material scientists. Existing processes to make this molecule involves hazardous chemicals and cumbersome purification steps.

TECHNOLOGY DESCRIPTION

NCL scientists have developed a straightforward, easy, environmentally benign, chromatography-free process for producing pillar-5-quinone using readily available starting materials and can be easily purified by crystallization.

MARKET POTENTIAL

There is great deal of interest in pillar-5-quinone for its potential use in Li-ion batteries and as molecular sensors. The electronic materials and chemicals market is worth over $ 59 billion (Link).

VALUE/ADVANTAGES

- Easy to adopt process
- Environmentally benign
- Non-chromatographic process
- Purification by crystallization

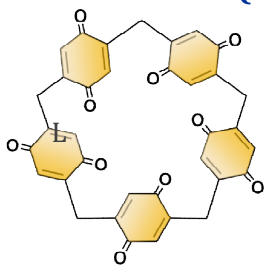
APPLICATIONS

- Molecule has potential use in Li-ion batteries, molecular sensors, electronic materials and in organic synthesis

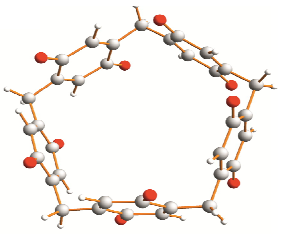
TECHNOLOGY STATUS

- Demonstrated at the lab scale
- On the lookout for potential partners for spin-off or licensing
- Patent granted in the US: US 9000224B1; Application filed in India: 2243/DEL/2013

STRUCTURE OF (P[5]Q)



Molecular structure of P[5]Q



Crystal structure of P[5]Q

CSIR-National Chemical Laboratory, Pune, India

Case Manager: **Magesh. N.|020-2590-2982|m.nandagopal@ncl.res.in**