# Process yielding high value fuel additives (octane enhancers) from lignin

## EXECUTIVE SUMMARY

Efficient process for the depolymerization of lignin to produce substituted phenolic monomer compounds that are further converted to fuel additives

## BACKGROUND

Fuel additives like octance enhancers have been traditionally derived from non-renewable petroleum products. Renewable sources such as lignin are being explored as a source for producing fuel additives. A number of single step processes for depolymerization of lignin have been explored to date only with limited success. Existing two-step processes occur under harsher conditions (max reaction temperature can reach 420 - 900° C).

## TECHNOLOGY DESCRIPTION

NCL scientists have developed an efficient 2 step process for depolymerization of lignin to substituted phenolic monomer compounds which could be further processed for use as high value fuels/additives. The process operates under milder reaction conditions (temperature range of 215- 250°C).  The reaction time is of 5 mins to 2 hrs. Product yield is >25%.

## MARKET POTENTIAL

- US market for specialty fuel additives including octane enhancers  has been predicted to grow 2.2 percent annually to reach $1.2 billion in 2012.*

  * http://www.reportlinker.com/p0100129-summary/US-Specialty-Fuel-Additives-Market.html (cited- 21/05/2012),

## VALUE/ADVANTAGES

- Yields fuel additives from a renewable source
- Milder reactions due to the solid acid catalyst used- work under 270° C
- Process is more environmentally friendly than the conventional processes due to the recyclable catalysts
- This process results in very little loss of the products in the form of gas or due to degradation

## APPLICATIONS

- End products of the reaction can be used to produce high value fuel additives like octane enhancers

## TECHNOLOGY STATUS

- Demonstrated at the lab scale
- On the lookout for potential partners for spin-off and licensing
- Patents filed:  IN# 2889DEL2010

*CSIR-National Chemical Laboratory, Pune, India*

*Case Manager*: **Magesh. N.|+91-20-2590-2982|m.nandagopal@ncl.res.in**          **www.nclinnovations.org**