

TECHNOLOGY OFFER

Access to novel p-hydroxy styrene polymer building blocks

The technology offers a new one-pot reaction to prepare efficiently various p-hydroxy styrene derivatives substituted on the aromatic core. The reaction only needs phenol derivatives and pyruvic acid as starting materials. The para-vinylated phenols of the enzymatic / biocatalytic reaction can be used e.g. as flavour compounds or as monomers for the production of polymers, likely novel polystyrene or polyphenol derivatives. Properties of the resulting polymers might offer the use as flame retardant material or might be of interest e.g. in the electronic industry.

BACKGROUND

A biochemical one-pot reaction to obtain halogenated p-hydroxy styrene derivatives has never been published in literature before. The invention is commercially interesting due to the growing polymer market. The product offers access to novel substituted polystyrene (PS) and polyvinylphenol (PVP) derivatives. PS obtains currently around 5% of worldwide (polymer) plastics market.

TECHNOLOGY

Substituted phenol can be transferred to the corresponding p-hydroxystyrene derivatives via an enzymatic / biocatalytic reaction just at the expense of pyruvate (see figure below). The only side product is CO₂ and water.

Further reading: <http://dx.doi.org/10.1002/anie.201505696>

ADVANTAGES

- Enhanced production: chemical one-pot reaction on enzymatic basis
- Environmental friendly production: only side products are CO₂ and water
- Use as flame retardant material
- Use as material offering enhanced stability
- Use as polymers as material for electronic devices such as LCD-TFT-displays
- Use as aroma compounds
- Possible naturally labeled reaction

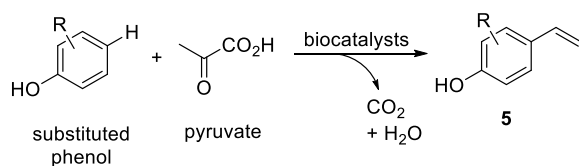


Fig. 1 – Vinylation of phenols in a one pot reaction

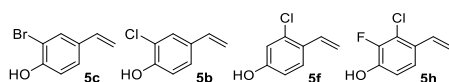


Fig. 2 – Examples of products

KEYWORDS:

POLYMER
POLYVINYLPHENOL
STYRENE
FLAME RETARDANT
GREEN CHEMISTRY
ELECTRONIC INDUSTRY
AROMA COMPOUNDS

INVENTORS:

BUSTO E., SIMON R., KROUTIL, W.

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CONTACT:

Gernot Faustmann

University of Graz
Research Management
Universitaetsplatz 3
8010 Graz

T: +43 316 380 3994

gernot.faustmann@uni-graz.at

www.uni-graz.at

www.wtz-sued.at