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Access to novel p-hydroxy styrene derivatives as polymer building blocks or aroma compounds

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 be of interest e.g. in the electronic industry.

BACKGROUND

A biocatalytic one-pot reaction to obtain p-hydroxy styrene derivatives has never been published in literature before. The invention is commercially interesting due to the growing polymer market as well as in flavour industry. The product offers access to flavour compounds as well as building blocks for novel substituted polyvinylphenol (PVP) derivatives.

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Substituted phenol can be transferred to the corresponding p-hydroxystyrene derivatives via a 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 biocatalytic basis
- Environmental friendly production: only side products are CO₂ and water
- Possible natural labeled reaction
- Aroma compounds
- Possible use as polymers as material for electronic devices such as LCD-TFT-displays

![Fig. 1 – Vinylation of phenols in a one pot reaction](image_1.png)

![Fig. 2 – Examples of products](image_2.png)