

## Accepted Manuscript

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PII: S1385-8947(15)00848-7  
DOI: <http://dx.doi.org/10.1016/j.cej.2015.06.009>  
Reference: CEJ 13780

To appear in: *Chemical Engineering Journal*

Received Date: 19 March 2015  
Revised Date: 2 June 2015  
Accepted Date: 3 June 2015

Please cite this article as: V. Simon, A. Thuret, L. Candy, S. Bassil, S. Duthen, C. Raynaud, A. Masseron, Recovery of hydroxycinnamic acids from renewable resources by adsorption on zeolites, *Chemical Engineering Journal* (2015), doi: <http://dx.doi.org/10.1016/j.cej.2015.06.009>



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## Recovery of hydroxycinnamic acids from renewable resources by adsorption on zeolites

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### Highlights

- Adsorption of hydroxycinnamic acids is quantified onto zeolites (FAU- and \*BEA-type structure) and polymer resin (Amberlite XAD16-type structure).
- Zeolites have higher adsorption capacities than those of polymer resin.
- Zeolites can be regenerated and reused in the extraction.
- Zeolites can be used to concentrate plant extracts.

### Keywords

Ferulic acid, *p*-coumaric acid, cinnamic acid, adsorption, renewable resources, zeolite

### Abstract

The aim of the study is to examine the adsorption capacity of hydroxycinnamic compounds (ferulic acid, *p*-coumaric acid, cinnamic acid) on zeolite adsorbents (FAU- and \*BEA-type structure) versus Amberlite resin XAD16. The pH and contact time effects on adsorption were evaluated. The adsorption capacity was dependent on pH and higher at pH less than pK<sub>a1</sub>. The kinetic adsorption is faster onto FAU and \*BEA zeolites than onto XAD16 resin. Maximum adsorption capacities were calculated for the target compounds for pH=3.5 by using the Langmuir isotherm model. They reached higher values for zeolites than for XAD16 and are respectively of 139, 122 and 109 mg g<sup>-1</sup> for ferulic, *p*-coumaric and cinnamic acids. Values around 30 mg g<sup>-1</sup> were observed for XAD16. Desorption ratios are close to 100 % for \*BEA zeolite and XAD16 resin in the presence of ethanol 96 %. The use of regenerated zeolites

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