

Área: ORG

Amino-functionalized pectin (Pec-NH₂) as a biomass-derived heterogeneous organocatalyst for the synthesis of 2-arylselanyl-1,3-diketones and pyrazoles

Daniela Hartwig (PQ),^{1*} Nicole C. M. Rocha (PG),¹ Livia C. L. Valente (PG),¹ Jaqueline F. de Souza (PG),² Raquel G. Jacob (PQ),¹ André R. Fajardo (PQ).²

*daniela.hartwig@ufpel.edu.br

¹Laboratório de Síntese Orgânica Limpa – CCQFA - UFPel; ² Laboratório de Desenvolvimento de Compósitos e Materiais Poliméricos – CCQFA - UFPel.

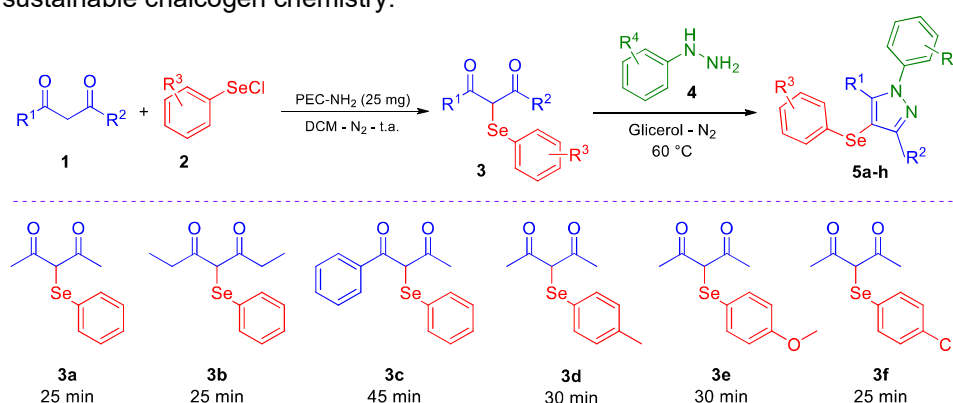
Palavras Chave: Arylselanyl-1,3-diketone; Organocatalyst; Polysaccharide; Pyrazole; Chalcogen chemistry

Highlights

Pectin (PEC) was functionalized with amino groups to obtain novel organocatalysts (PEC-NH₂); The organocatalytic activity of PEC-NH₂ was evaluated in the synthesis of 2-arylselanyl-1,3-diketones; PEC-NH₂ efficiently catalyzes C-Se bond formation under mild and metal-free conditions; The methodology provides access to valuable 1,3-dicarbonyl intermediates for chalcogen-pyrazoles synthesis.

Abstract

We report the use of amino-functionalized pectin (Pec-NH₂) as a reusable heterogeneous organo-catalyst for the synthesis of 2-arylselanyl-1,3-diketones **3a-f** and their conversion into 4-arylselanyl-1H-pyrazoles **5a-h**. The α -selanylation proceeded efficiently at room temperature, delivering product **3a** in 80% yield within 25 min with the advantage of easy catalyst recovery by filtration. Pec-NH₂ was reused for three cycles with only a slight decrease in yield, while FTIR and ¹H NMR of the recovered catalyst indicated adsorption of substrates/products after multiple runs. The crude diketones were directly cyclocondensed with arylhydrazines in glycerol at 60 °C, affording pyrazoles in 71–85% yield. This study highlights pectin as a biobased, recyclable organocatalyst, expanding the scope of polysaccharides in sustainable chalcogen chemistry.



Scheme 1. Synthesis of 2-arylselanyl-1,3-diketones and pyrazoles.

Acknowledgments

We thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001. FAPERGS, CNPq and FINEP for financial support.

References: *Chemsuschem.* 2021, 14, 2785. *Polym.* 2018, 10, 768. *Crit. Rev. Food Sci Nutr.* 2015, 55, 1684. *Tetrahedron Lett.* 2013, 54, 1538. *Synthesis*, 2012, 44, 2527. *Synth. Commun.* 2010, 40, 1708. *Carbohydrate Polymers*, 2012, 87, 1950.