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Address: Teplická 492, 190 00 Prague 9, Czechia

DAY-2 **Posters**

Poster Judges: Wen Zhong, *Canada* & Farzan Gity, *Ireland*

Wormwood as a sustainable resource for catalyst development

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The search for sustainable and efficient catalysts is crucial in industrial processes, particularly in environmental remediation, energy production, and chemical synthesis. Wormwood (*Artemisia vulgaris*), a perennial herb rich in bioactive compounds, has emerged as a promising material for catalyst production [1, 2]. This study explores its unique chemical properties, environmental benefits, and applications in catalysis. Wormwood contains secondary metabolites such as flavonoids, terpenoids, and alkaloids, which exhibit antioxidant and antimicrobial properties. These compounds offer interesting reactivity in catalytic reactions, making wormwood a viable source of bio-derived molecules for heterogeneous and homogeneous catalysis. The sustainability of wormwood-based catalysts makes them attractive alternatives to conventional materials, which often rely on scarce or toxic metals. Wormwood is abundant, renewable, and requires minimal environmental impact for cultivation, aligning with green chemistry initiatives. Its application in catalysis could reduce the ecological footprint of chemical processes while maintaining efficiency and selectivity. Wormwood's catalytic potential includes its chemical composition, bioactive compound extraction, and efficacy in oxidation, reduction, and C–C bond formation reactions. Initial studies suggest wormwood-derived catalysts perform comparably or better than traditional catalysts in selectivity, efficiency, and recyclability.

Challenges in scaling up include optimizing extraction techniques, stabilizing bioactive compounds, and integrating wormwood-based catalysts into industrial applications. Hybrid catalysts combining wormwood with conventional metals or oxides could further enhance catalytic properties and broaden applications.

In conclusion, wormwood presents sustainable and underexplored material for catalyst production. Its unique chemical profile and potential for high-performance catalysis make it a valuable candidate for further research in green chemistry.

REFERENCES

1. Pitak, A. Sholokhova, R. Kalpokaitė-Dičkuvienė, A. Baltušnikas, R. Kriūkienė, A. Bakšinskaitė, M. Toleikienė. Transformative potential: Utilizing Teos-modified mugwort for sustainable construction. *Case Studies in Construction Materials*, 2024, 21, e03550. <https://doi.org/10.1016/j.cscm.2024.e03550>.
2. I. Pitak, A. Sholokhova, A. Baltušnikas, R. Kalpokaitė-Dičkuvienė. Wormwood as a potential material for catalyst synthesis. 2nd Central and Eastern European conference on physical chemistry & material science (CEEC-PCMS2): 16–19 September 2024, Kaunas, Lithuania.

Biography:

Inna Pitak is a sustainable technologies expert focused on waste management, environmental restoration, and renewable energy. She develops mugwort-based catalysts for hydrogen fuel and advances material recovery to support a circular economy. Her work includes sustainable concrete for hazardous waste storage and landfill resource recovery for cleaner waste-to-energy solutions. Through green innovations, she transforms waste into valuable resources, promoting sustainability.