

Co-processing of atmospheric gas oil with furfuralacetone aldol condensation adducts

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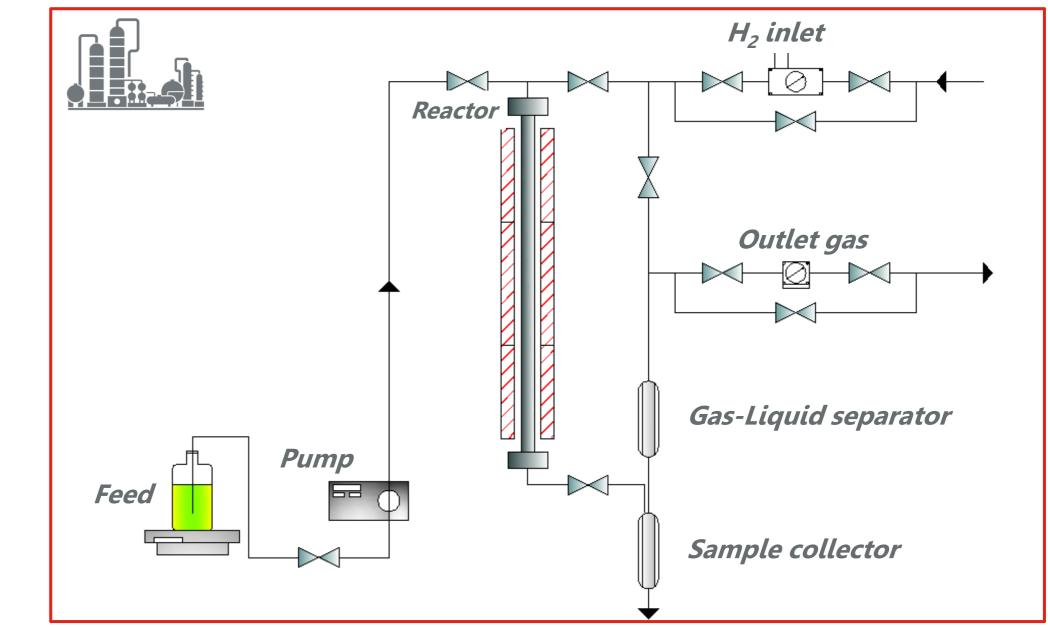
The aldol condensation is an organic synthesis reaction, which produces interesting platform molecules from furfural and acetone.

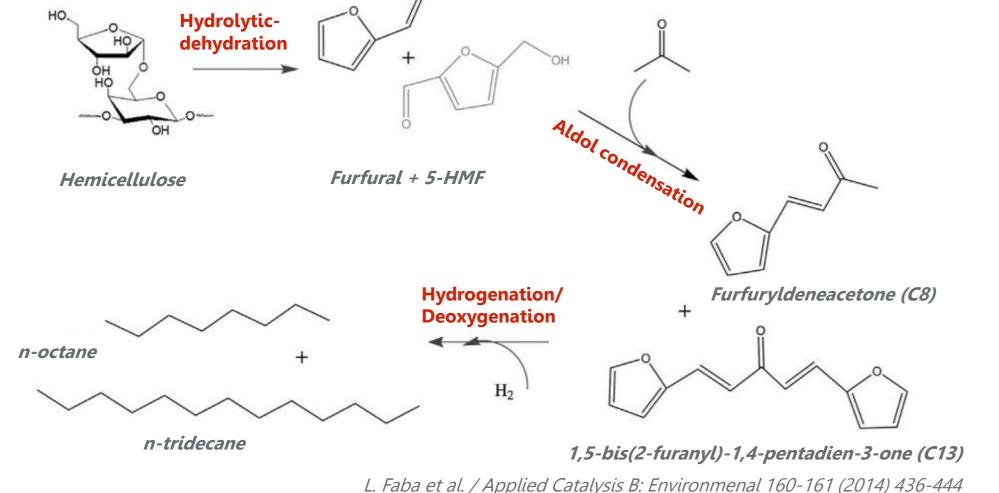
The hydrodeoxygenation of these furfural-acetone aldol condensation adducts means a valuable catalytic upgrading into n-alkanes in the gasoline or kerosene range.

The conventional sulfided catalysts (NiMoS/Al₂O₃ and CoMoS/Al₂O₃) suffer a fast deactivation during the raw material's hydrotreatment. The co-processing with gasoil, using isopropanol as co-solvent, seems to be a promising alternative route for the hydrotreating of these platform molecules.



Experimental setup





This study reports the co-processing of atmospheric gas oil, furfuralacetone adducts and isopropanol using hydrotreating industrial conditions and commercial catalysts.

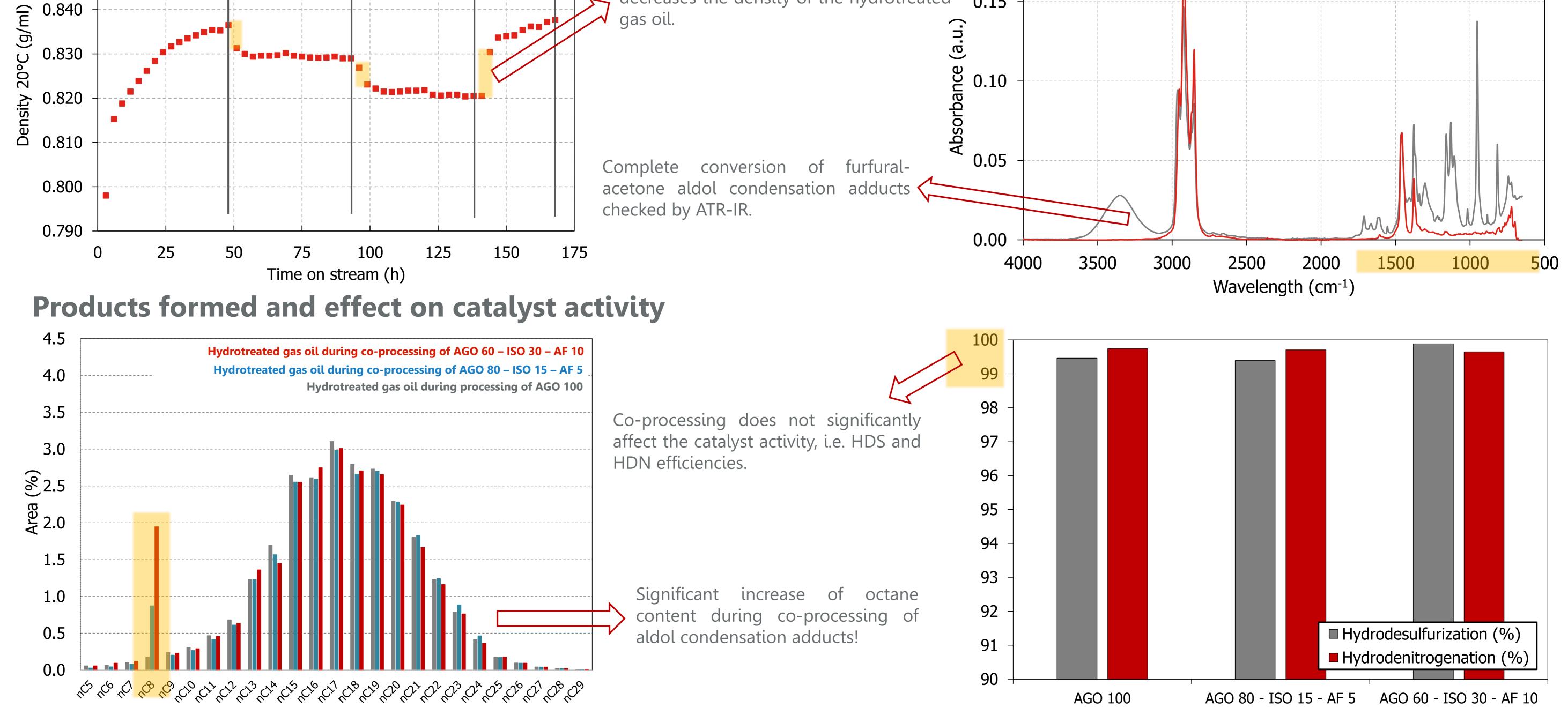
Operating conditions

Parameter	Value	Unit
Temperature	220 (top) 320 (middle and bottom)	°C
Pressure	5.5	MPa
WHSV	0.5	h ⁻¹
Co-processing ratio	Atmospheric gas oil (AGO): 80 - 60 Isopropanol (ISO): 15 - 30 Furfural-acetone adducts (AF): 5 -10	%
Catalyst	100 (commercial CoMo/Al ₂ O ₃)	g
H ₂ flow rate	120	NL/h



Co-processing of atmospheric gas oil, isopropanol and furfural-acetone adducts

0 860 -						0 20			
0.860 -	Co-processingCo-processingAGO 100AGO 80 - ISO 15 - AF 5AGO 60 - ISO 30 - AF 10AGO 100			E 10 AGO 100		Hydrotreated ga	Hydrotreated gas oil during co-processing of AGO 60 – ISO 30 – AF 10		
		AGO 80 - 150 13 - Al 3	AGG 00 - 150 30 - A					Feedstr	ock: AGO 60 – ISO 30 – AF 10
0.850 -									
0.030					The production of light compounds				
					decreases the density of the hydrotreated	0 15			





✓ Furfural-acetone Adol condensation adducts have been successfully co-processed with gasoil and Isopropanol.

✓ No significant decrease in catalyst activity (in terms of HDS or HDN efficiencies) was observed during AF adducts co-processing.

Y The addition of AF-adducts results in a significant increase of octane content in the hydrotreated gas oil, affecting some of its properties.



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