

Supporting Information

Photocatalytic conversion of lignocellulosic biomass to valuable products

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Table S1 The main products of lignin photocatalysis and their applications

Products	Applications	Market demand
Guaiacol	Precursor to flavours	High
Vanillin	Food flavouring, fragrance, pharmaceutical, cosmetics industries	High
Succinic acid	Precursor to polymers, resins and solvents	High
Malonic acid	Precursor of polyesters, used in electronic, flavours and fragrances, and pharmaceutical industries	High
Syringaldehyde	Pharmaceuticals, food, cosmetics, textiles, pulp and paper industries and biological control applications	High
Pyrocatechol	Precursor of pesticides, flavours and fragrances	High
Styrene	Precursor of latex, synthetic rubber, and polystyrene resins	High
Ethyl Benzene	Gasoline anti-knock agent	Medium

Table S2 The hydrolysis of cellulose on Ir/Amberlyst-15 and Ir/HY₃ catalysts. Reprinted with permission from ref. 1.

Catalyst	Temperature (°C)	Light	Time (h)	Cellobiose (%)	Glucose (%)	5-HMF (%)	Total (%)
Ir/Amberlyst-15	70	+	72	11.9	43.2	17.5	72.6
Ir/Amberlyst-15	70	-	72	8.9	8.2	1.0	18.1
Ir/Amberlyst-15	90	+	9	13.7	54.1	5.4	73.2
Ir/Amberlyst-15	90	-	9	10.6	13.0	1.9	25.5
Ir/HY ₃	90	+	13	10.9	40.4	24.0	75.3
Ir/HY ₃	90	-	13	7.0	0.3	1.1	8.4

References

1. Zhang, B., et al., Photothermally promoted cleavage of β -1,4-glycosidic bonds of cellulosic biomass on Ir/HY catalyst under mild conditions. *Appl. Catal., B*, 2018. **237**, 660-664.