Diagrama, Esquemático

Descripción generada automáticamente

Scheme S1. Reaction routes, phenol HDO. DDO: Direct deoxygenation; HD*x*; hydrogenation steps; DHY: Dehydration. Based on [S1].

Gráfico, Histograma

Descripción generada automáticamente

Figure S1. (a) N2 adsorption isotherms (at -196 °C) of Pt(1.5 wt%)-impregnated solids over pristine SBA-15 and corresponding La-modified materials at various nominal rare warth contents. Open symbols: desorption branch; (b)Pore size distribution (BJH, desorption branch data) of studied solids. Formulations calcined at 500 °C.

Gráfico, Gráfico de dispersión

Descripción generada automáticamente

Figure S2. Plot for calculation of *k* (pseudo first order kinetic constant) phenol HDO. Catalyst: PSBA-15. T=250 °C, P=3.2 MPa, n-decane as solvent, batch reactor, ∼107 rad s-1 (1030 rpm) mixing speed. Least squares linear regression, R2=0.928.

Gráfico, Gráfico de líneas

Descripción generada automáticamente

Figure S3. NH3 TPD profiles of various studied materials at different nominal La content.

Gráfico, Gráfico de líneas

Descripción generada automáticamente

Figure S4. CO2 TPD profiles of various studied materials at different nominal La content.

Diagrama

Descripción generada automáticamente

Figure S5. Thermal analysis ((a) thermogravimetric; (b) differential thermogravimetric) profiles of SBA-15 -15 and La-modified support at 8 wt% rare earth nominal content. Corresponding Pt-impregnated material also included. Samples calcined at 500 °C.

Table S1. Textural properties Pt (1.5 wt%) impregnated SBA-15 and various modified materials at several La nominal contents.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample | SBET  (m2g-1) | Vp  (cm3g-1) | aDp  Peak 1 | (nm)  Peak 2 | bSBET  (m2g-1) | SBET/bSBET |
| PSBA-15 | 612 | 0.82 | 3.99 | 6.19 | 781 | 0.78 |
| PLa1 | 624 | 0.73 | 4.02 | 5.34 | 695 | 0.90 |
| PLa2 | 644 | 0.90 | 3.92 | 6.50 | 573 | 1.12 |
| PLa4 | 568 | 0.71 | 4.00 | 5.70 | 664 | 0.86 |
| PLa8 | 475 | 0.60 | 3.95 | 5.65 | 675 | 0.70 |

afrom BJH plot, desorption branch data

bTheoretical value considering well-dispersed non-porous Pt phase component

Table S2. Relative area of signals at various desorption temperatures (Td), NH3 TPD over martials at different nominal La content.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample | Very weak  80<Td<250 | Weak  250<Td<380 | Medium  380<Td<450 | | Strong  450<Td<550 | Total |
| SBA-15 | 863 | 0 | | 0 | 75 | 938 |
| PSBA-15 | 691 | 89 | | 0 | 91 | 871 |
| PLa1 | 591 | 0 | | 0 | 55 | 646 |
| PLa2 | 457 | 107 | | 0 | 82 | 646 |
| PLa4 | 667 | 125 | | 0 | 75 | 867 |
| PLa8 | 23 | 39 | | 19 | 47 | 128 |

Td [=]°C, desorption temperature, to classify sites strength

Table S3. Relative area of signals, CO2 TPD over materials at different nominal La content.

|  |  |
| --- | --- |
| Sample | Signal (  area units? |
| SBA-15 | 19 |
| PSBA-15 | 43 |
| PLa1 | 24 |
| PLa2 | 22 |
| PLa4 | 15 |
| PLa8 | 11 |

**References**

S1. Pinzón-Ramos, I.; Castillo-Araiza, C.O.; Tavizón-Pozos, J.A.; de los Reyes, J.A. On a Response Surface Analysis: Hydrodeoxygenation of Phenol over a CoMoS-Based Active Phase. Catalysts 2022, 12(10), 1139. DOI: 10.3390/catal12101139.