

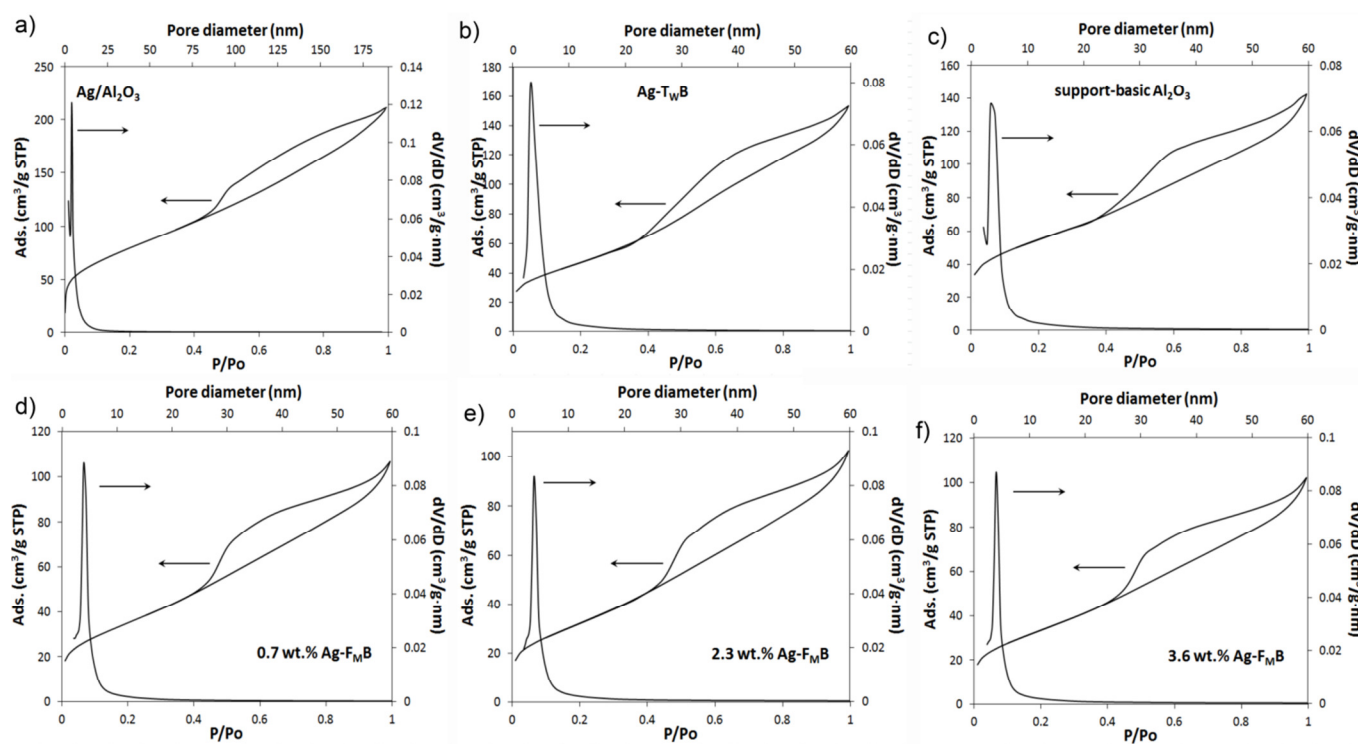
Catalysis Science & Technology

Electronic Supplementary Information (ESI)

Performance of Ag/Al₂O₃ catalysts in the liquid phase oxidation of glycerol – effect of preparation method and reaction conditions

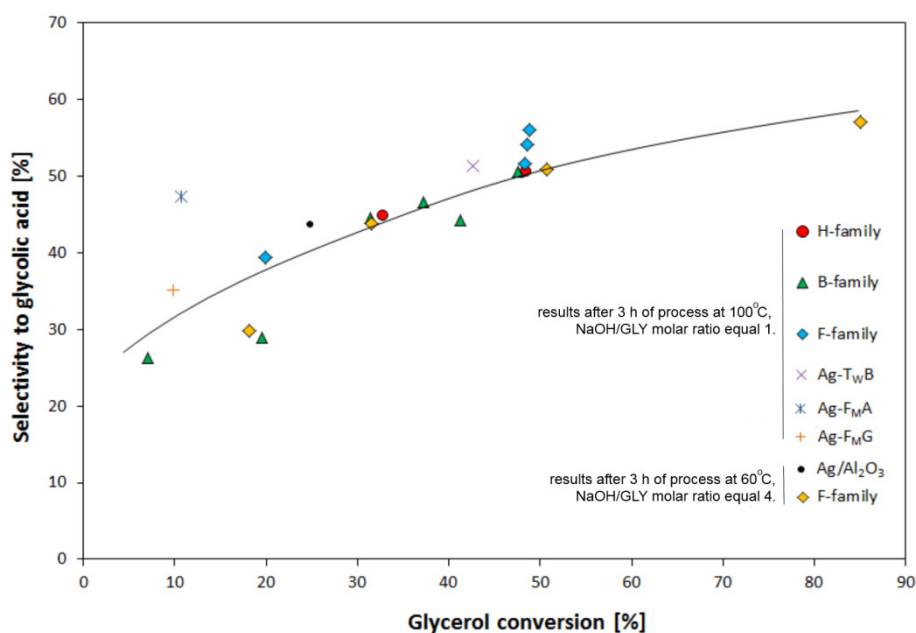
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ESI 1 – N₂ adsorption-desorption isotherms.



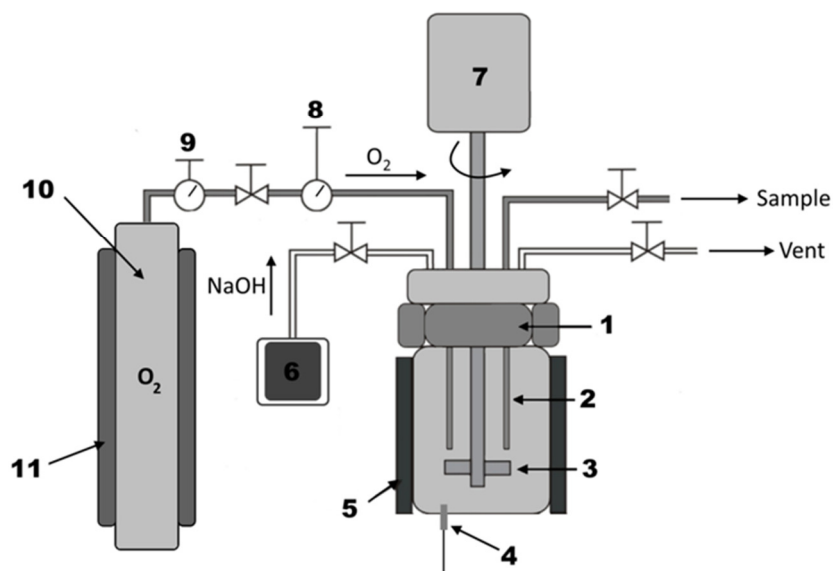
Nitrogen adsorption/desorption profiles and calculated pore diameter distribution (BJH method) of fresh catalyst samples: (a) commercial Ag/Al₂O₃; (b) catalyst Ag-T_WB prepared by thermal reduction method; (c) basic alumina support; (d-f) catalysts prepared by formaldehyde reduction method with various silver loading.

ESI 2 – Selectivity to glycolic acid as a function of glycerol conversion over the supported silver catalysts.



Selectivity to glycolic acid plotted as a function of glycerol conversion over all the tested catalysts. Main reaction conditions: 3 h of process, 5 bars of oxygen, 0.5 g of catalyst, 200 cm³ of a 0.3 M pure glycerol solution, reaction temperature and NaOH/GLY molar ratio as stated on the figure.

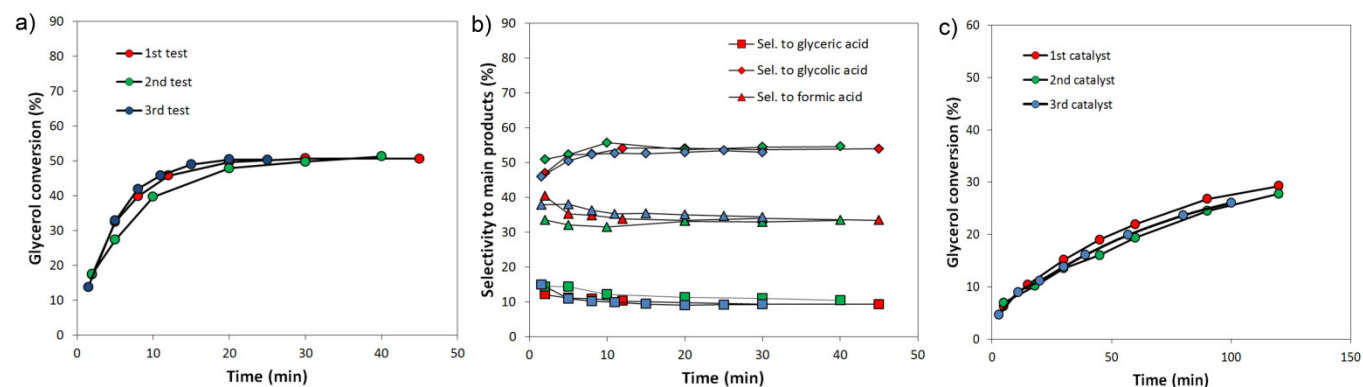
ESI 3 – Scheme of the catalytic test rig.



Elements on scheme:

- | | | |
|------------------|--------------------------------|-------------------------------------|
| 1. Autoclave | 5. Heating ring for autoclave | 9. Oxygen reserve controller |
| 2. Sampling line | 6. High pressure pump | 10. Oxygen reserve |
| 3. Stirrer | 7. Stirrer controller | 11. Heating ring for oxygen reserve |
| 4. Thermocouple | 8. Reactor pressure controller | |

ESI 4 – Reproducibility of the results.



Glycerol conversions and selectivities to the main products observed during three independent tests using the 3.6 wt.% Ag-F_MB catalyst (figures a & b) at 100 °C and NaOH/GLY = 1 molar ratio, and comparison of the glycerol conversion using three different baths of 1.1 wt.% Ag-F_MB catalyst (figure c) at 60 °C using NaOH/GLY molar ratio of 4. Other reaction conditions: 0.5 g of catalyst, 200 cm³ of a 0.3 M pure glycerol solution, 5 bars of oxygen, 1500 rpm.