

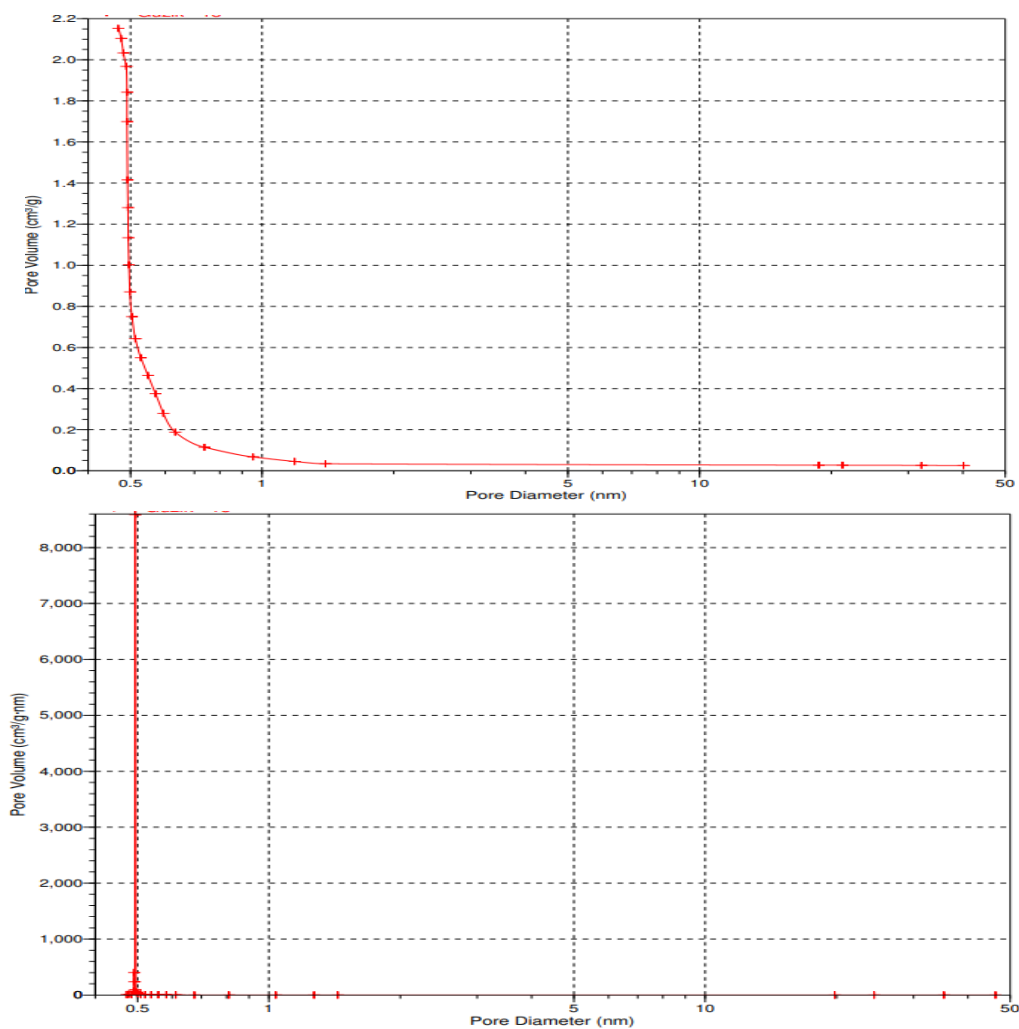
# Hierarchical Zeolites Containing Vanadium or Tantalum and Their Application in Cyclohexene Epoxidation Reaction

Paulina Szczygłewska, Agnieszka Feliczak-Guzik \*, Sylwia Chałupniczak and Izabela Nowak \*

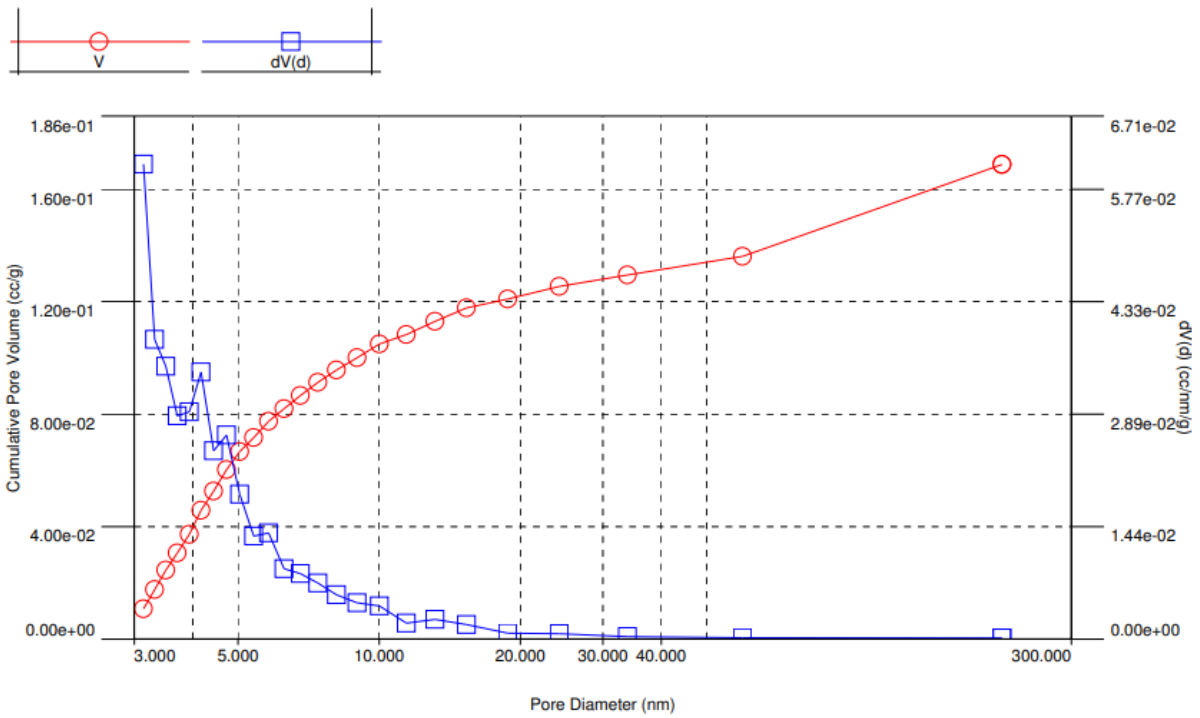
Faculty of Chemistry, Adam Mickiewicz University in Poznań, Uniwersytetu  
Poznańskiego 8, 61-614 Poznań, Poland; paulina.debek@amu.edu.pl (P.S.);  
sylwia.chałupniczak@amu.edu.pl (S.C.)

\* Correspondence: agaguzik@amu.edu.pl (A.F.-G.); nowakiza@amu.edu.pl (I.N.);  
Tel.: +48-61-829-1747 (A.F.-G.); +48-61-829-1580 (I.N.)

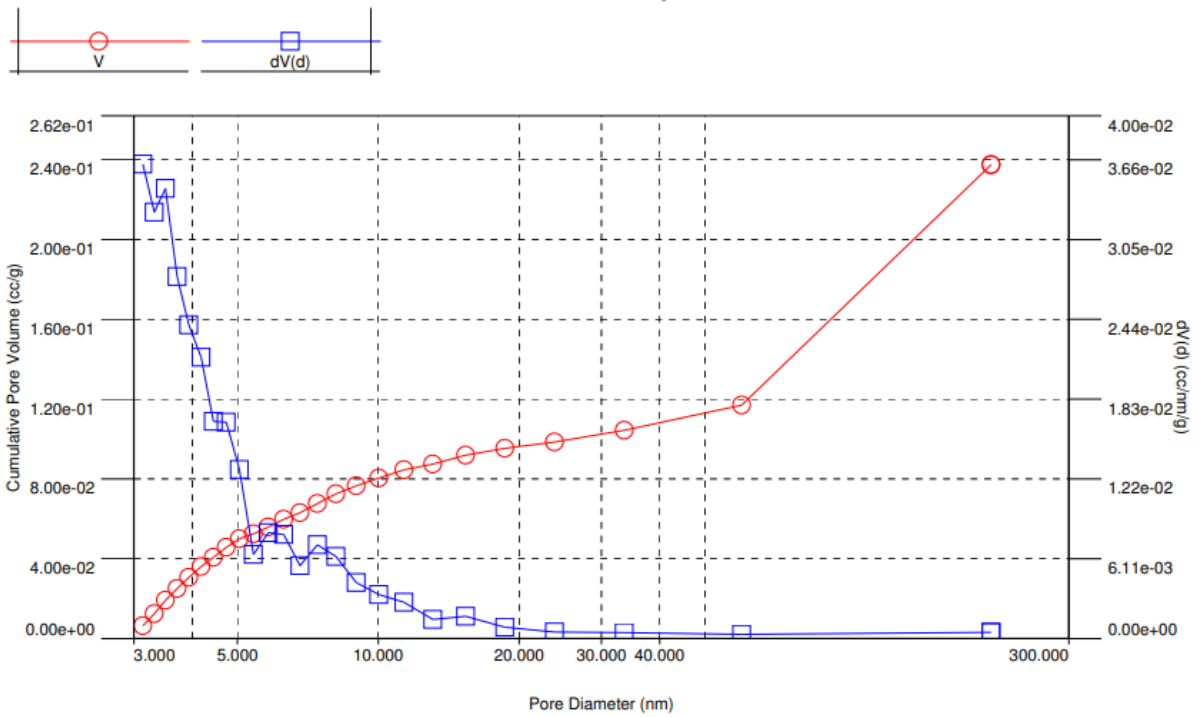
## HZ-commercial



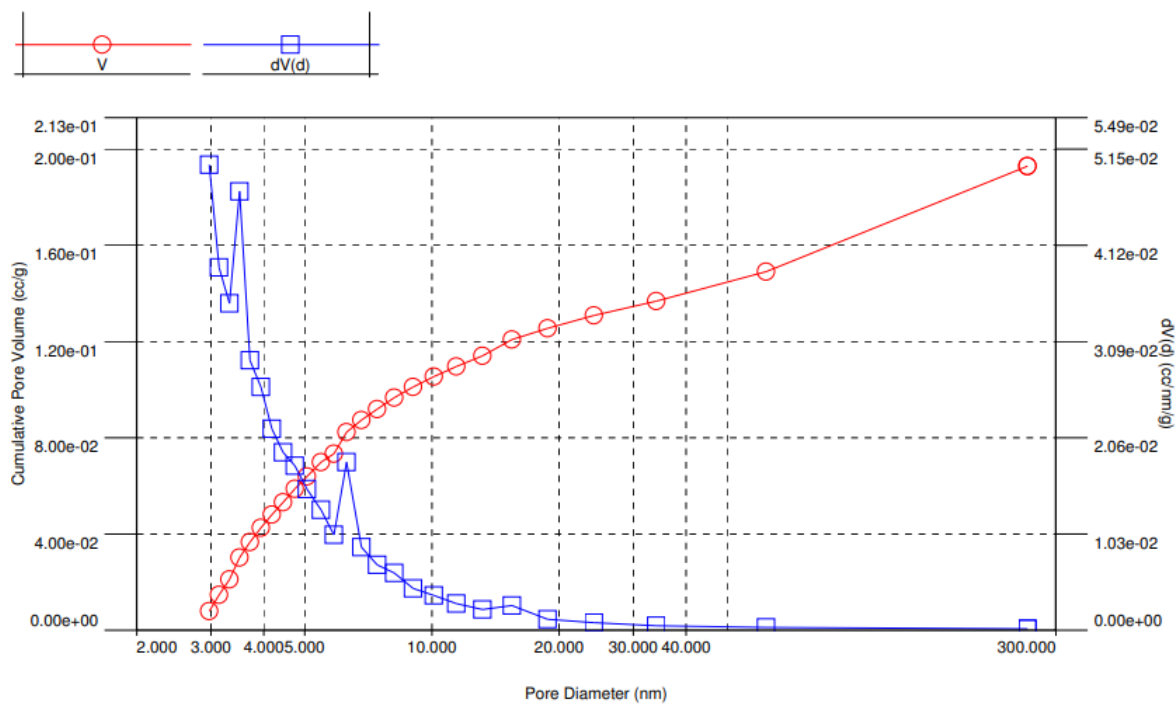
## HZ



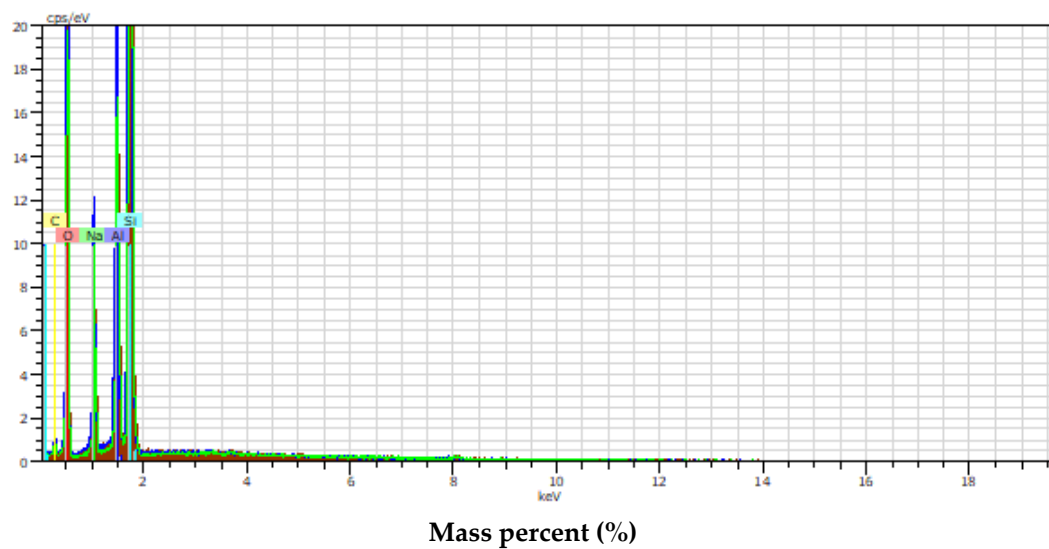
**HZ-Ta**



**HZ-V**

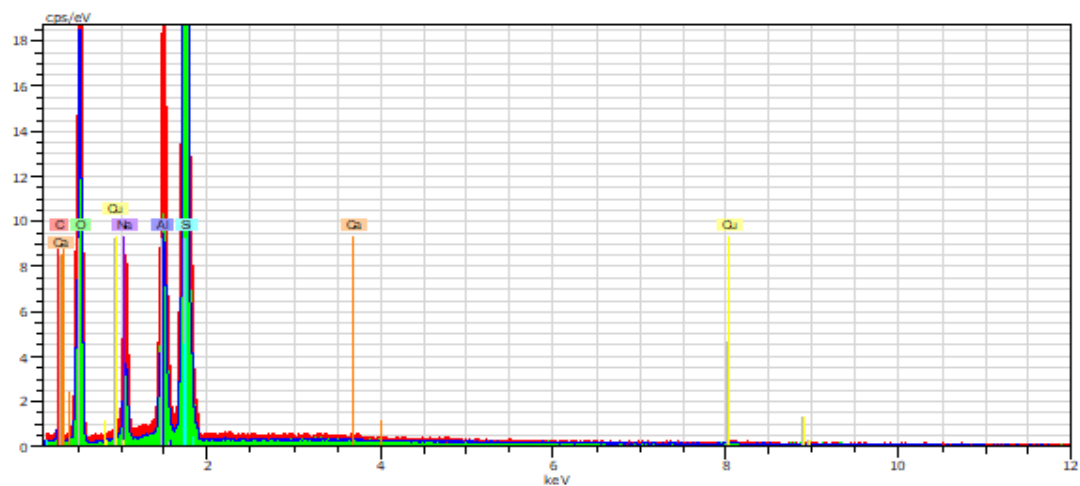


**Figure S1.** Pore size distribution of hierarchical materials.



Spectrum	C	O	Na	Al	Si
Mean value from 30 points:	3.34	42.36	1.79	13.07	30.43

**Figure S2.** EDX profile for HZ-commercial.

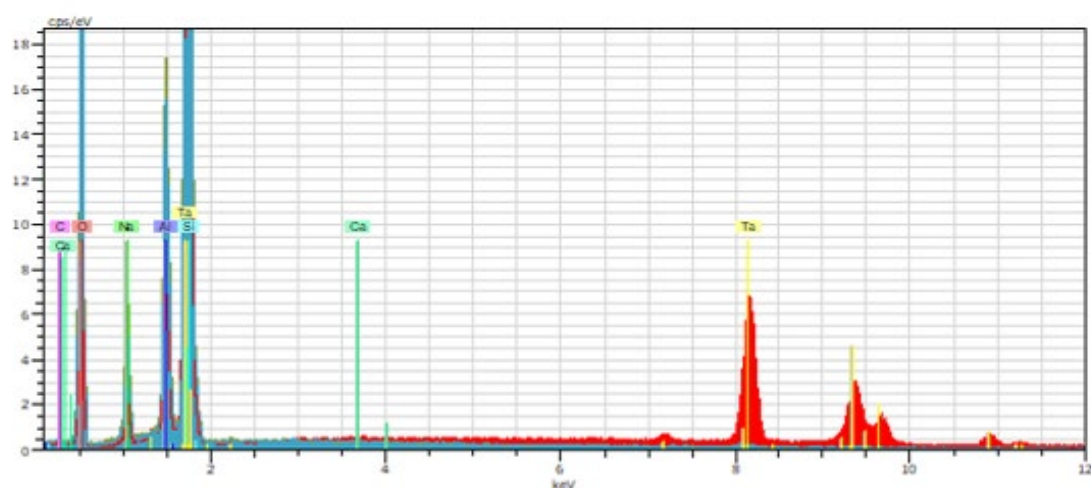


Mass percent (%)

Spectrum	C	O	Na	Al	Si	Ca*	Cu*
Mean value from 30 points:	2.36	47.07	6.10	9.70	34.12	0.14	0.50

\* impurities

Figure S3. EDX profile for HZ.

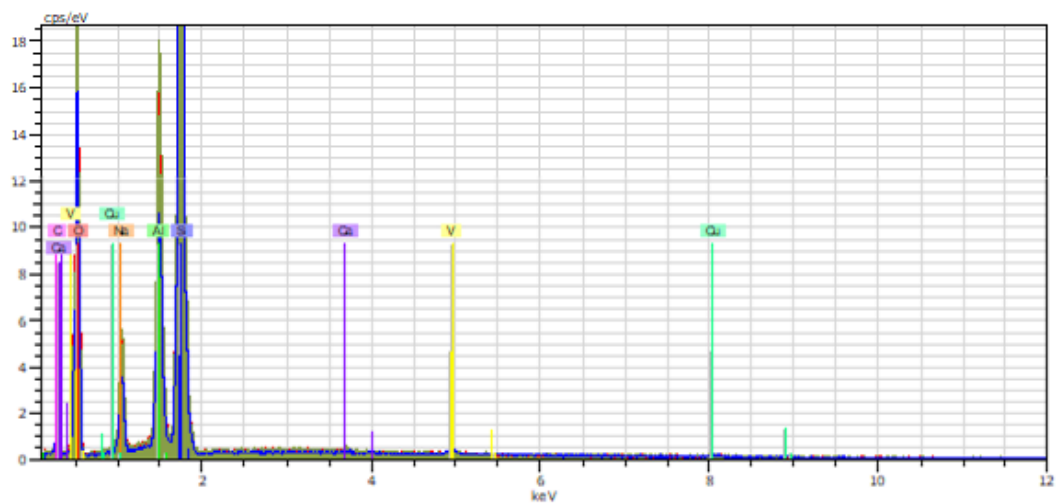


Mass percent (%)

Spectrum	C	O	Na	Al	Si	Ca*	Ta
Mean value from 30 points:	2.34	38.64	5.16	8.69	32.68	0.14	1.63

\* impurities

Figure S4. EDX profile for HZ-Ta.



Mass percent (%)

Spectrum	C	O	Na	Al	Si	Ca*	V	Cu*
Mean value from 30 points:	3.24	42.95	5.75	10.66	36.51	0.05	0.35	0.49

\* impurities

Figure S5. EDX profile for HZ-V.

Table S1. Chemical composition of zeolite Y (FAU)

SiO <sub>2</sub>	57.94 wt.%
Al <sub>2</sub> O <sub>3</sub>	19.03 wt.%
Na <sub>2</sub> O	1.95 wt.%
SiO <sub>2</sub> /Al <sub>2</sub> O <sub>3</sub> mole ratio	5.10