Creating the Geopolymer Standards

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Standardized Method in Testing Commercial Metakaolins for Geopolymer Formulations.

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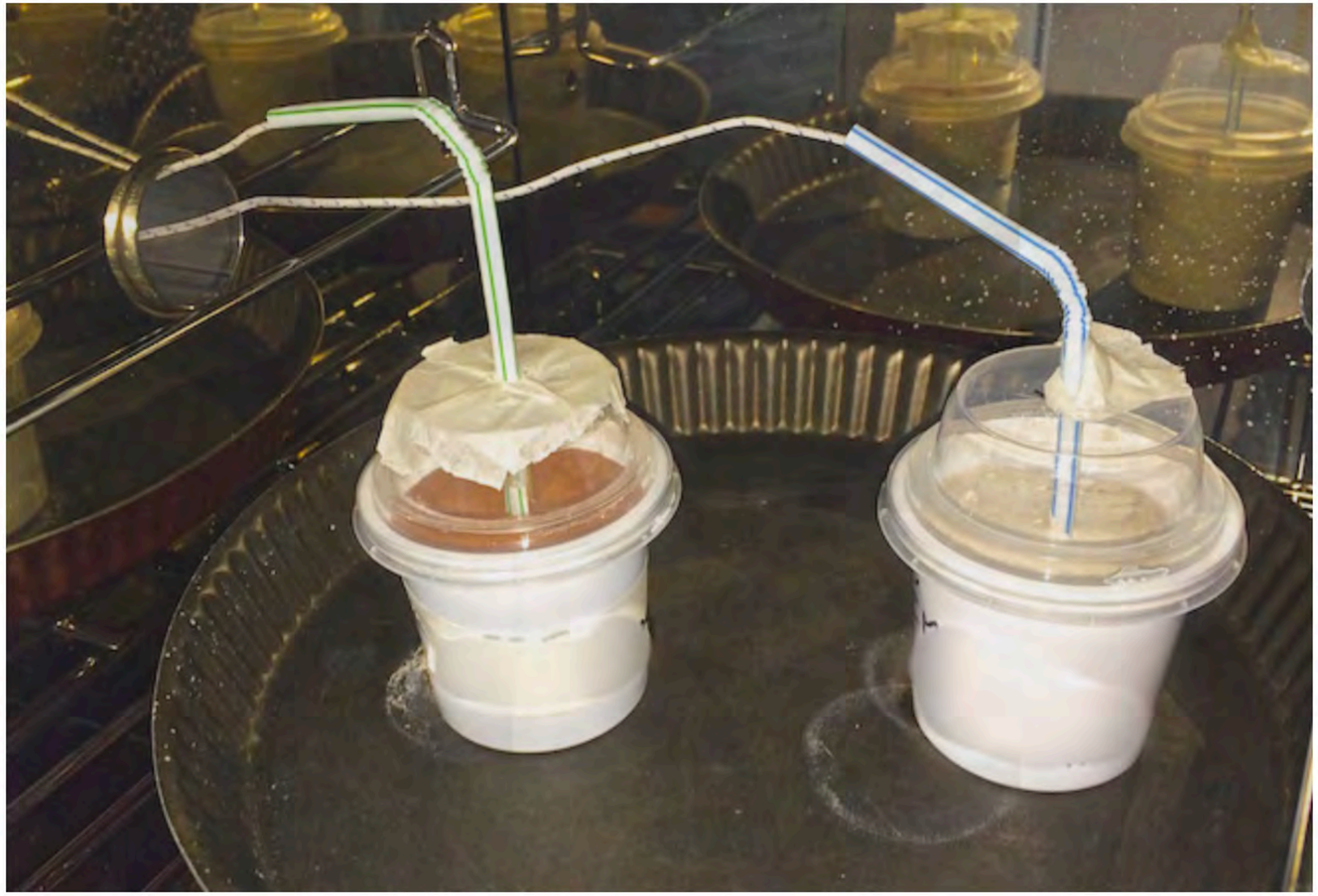
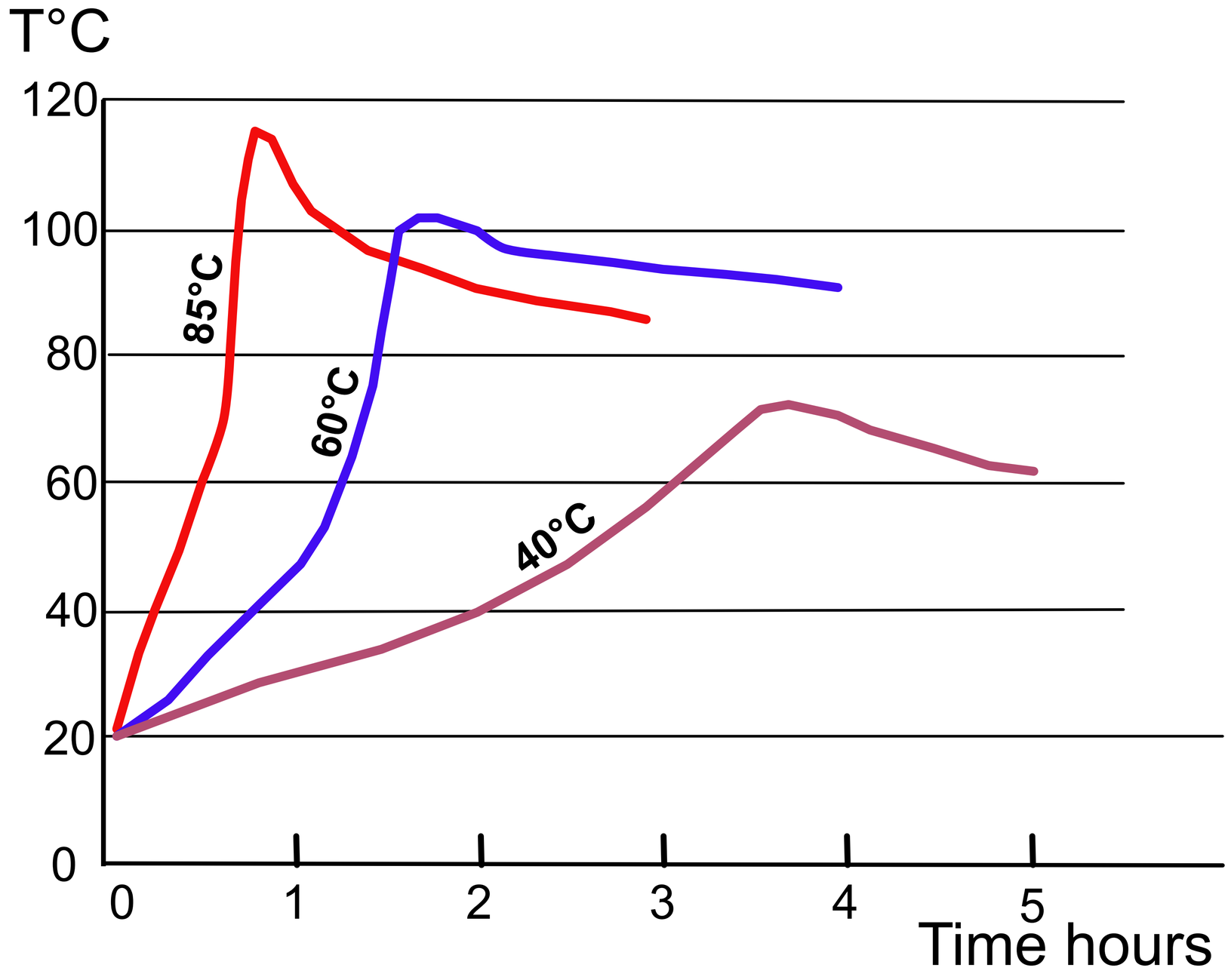
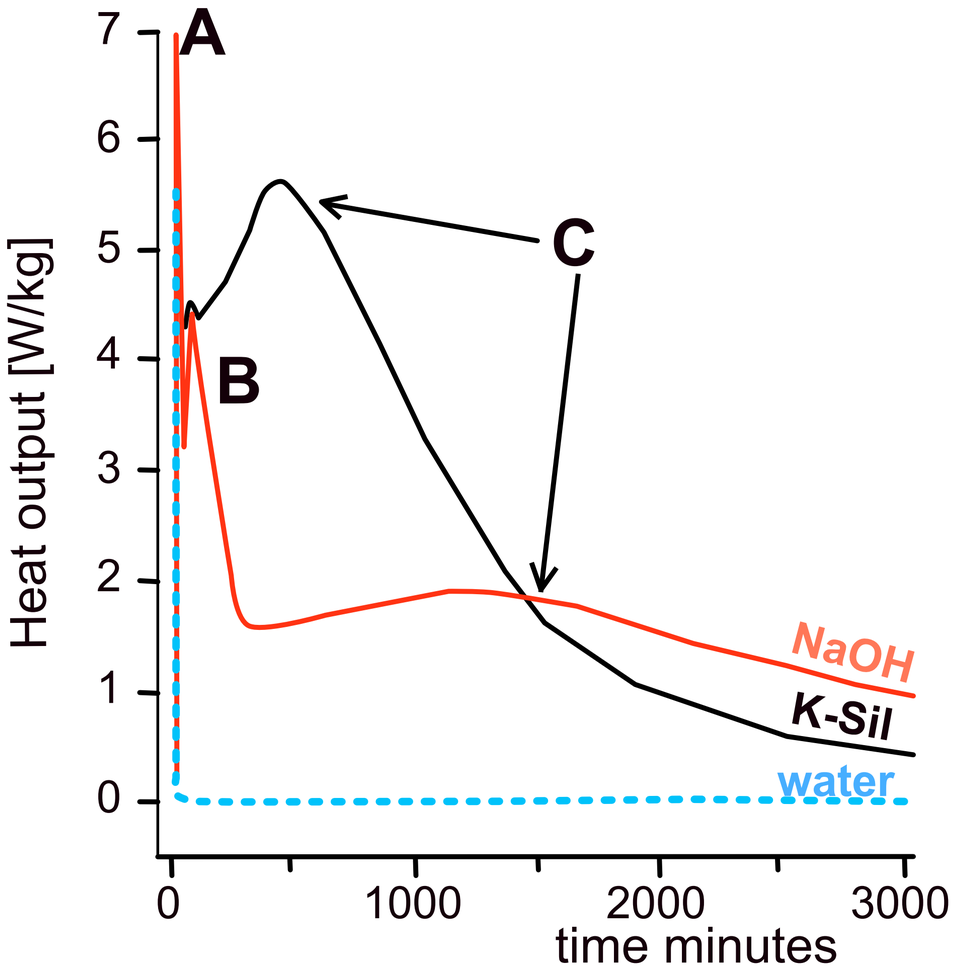
Reactivity test, observing exothermicity

see: *J. Davidovits, Geopolymer Chemistry and Applications, Chapter 8.*

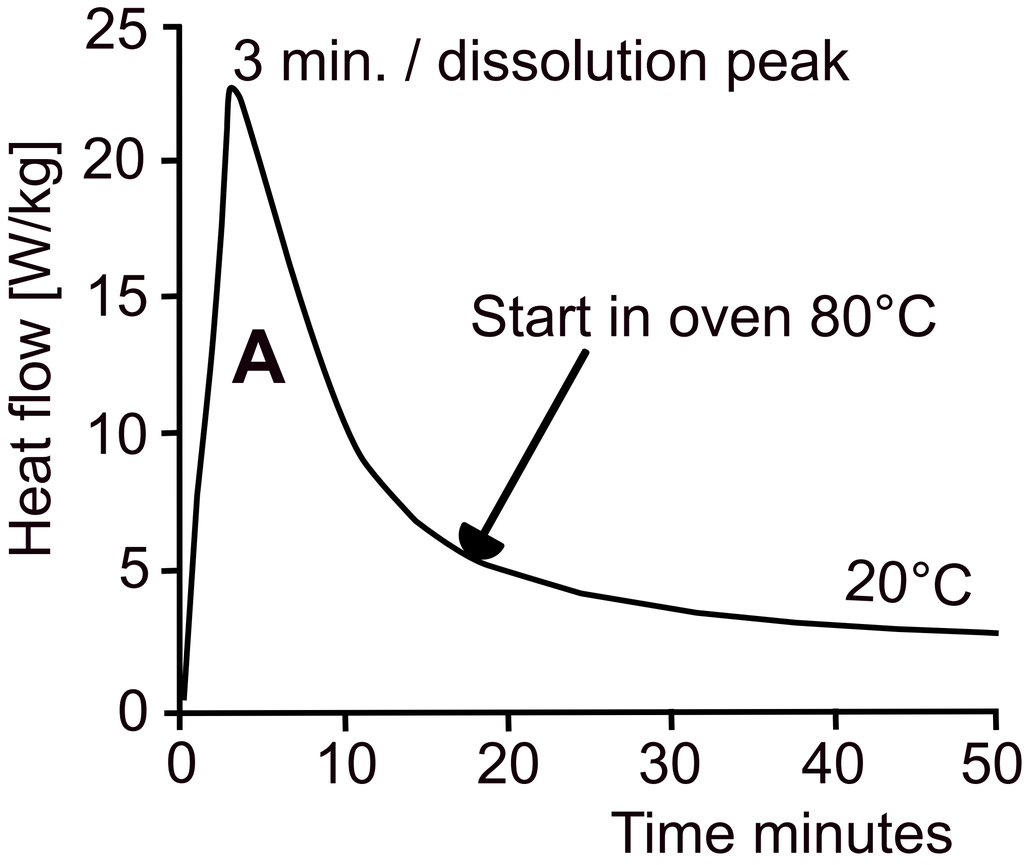


Exothermic polycondensation of MK-750-based geopolymer binder K-PSS at different curing temperatures





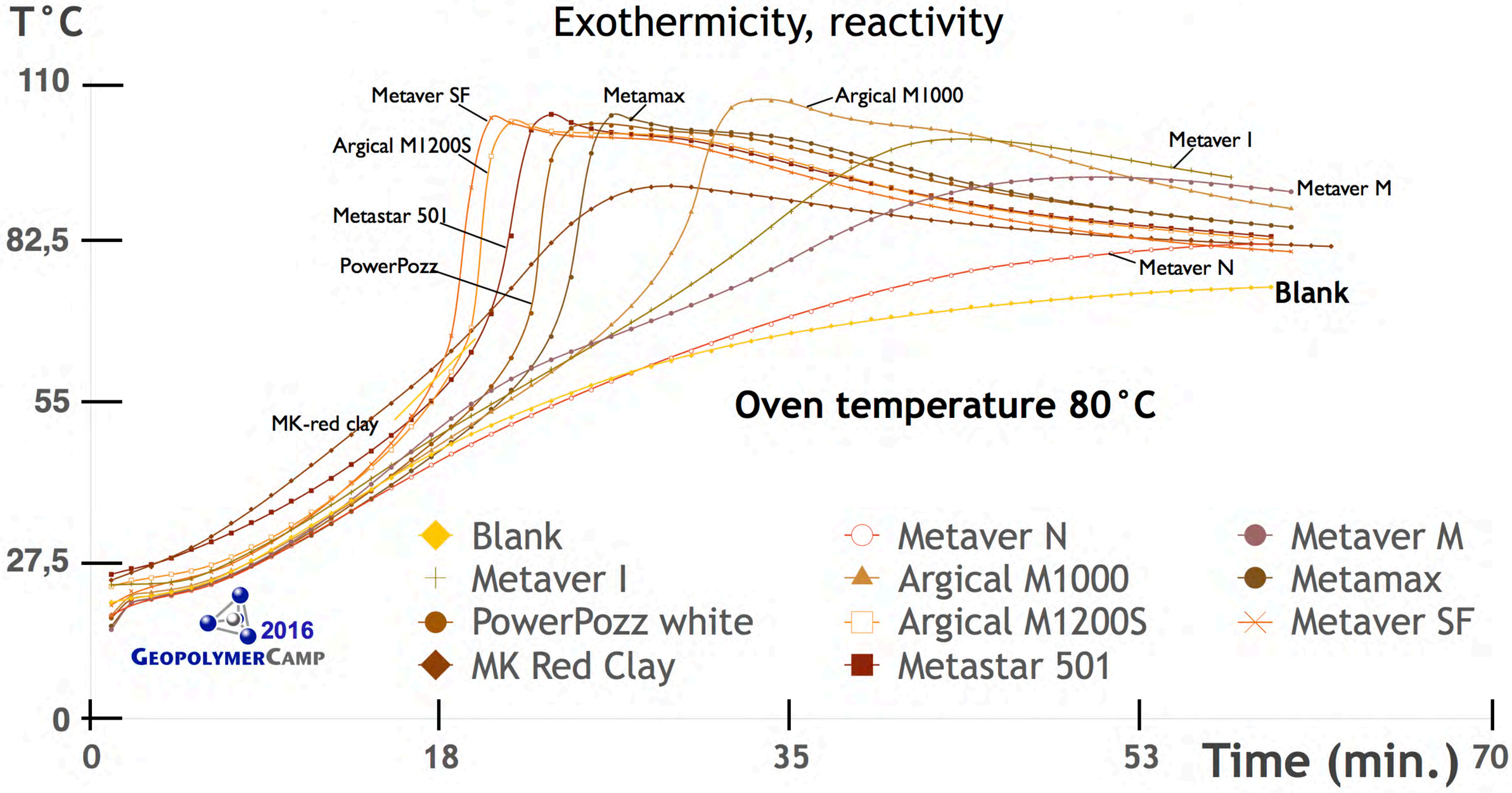
Heat flow isothermal calorimetry at 20°C, DSC with the systems NaOH/MK, K-Sil/MK and water/MK.



Exothermal peak (A) for NaOH/ MK at 20°C, heat flow with time

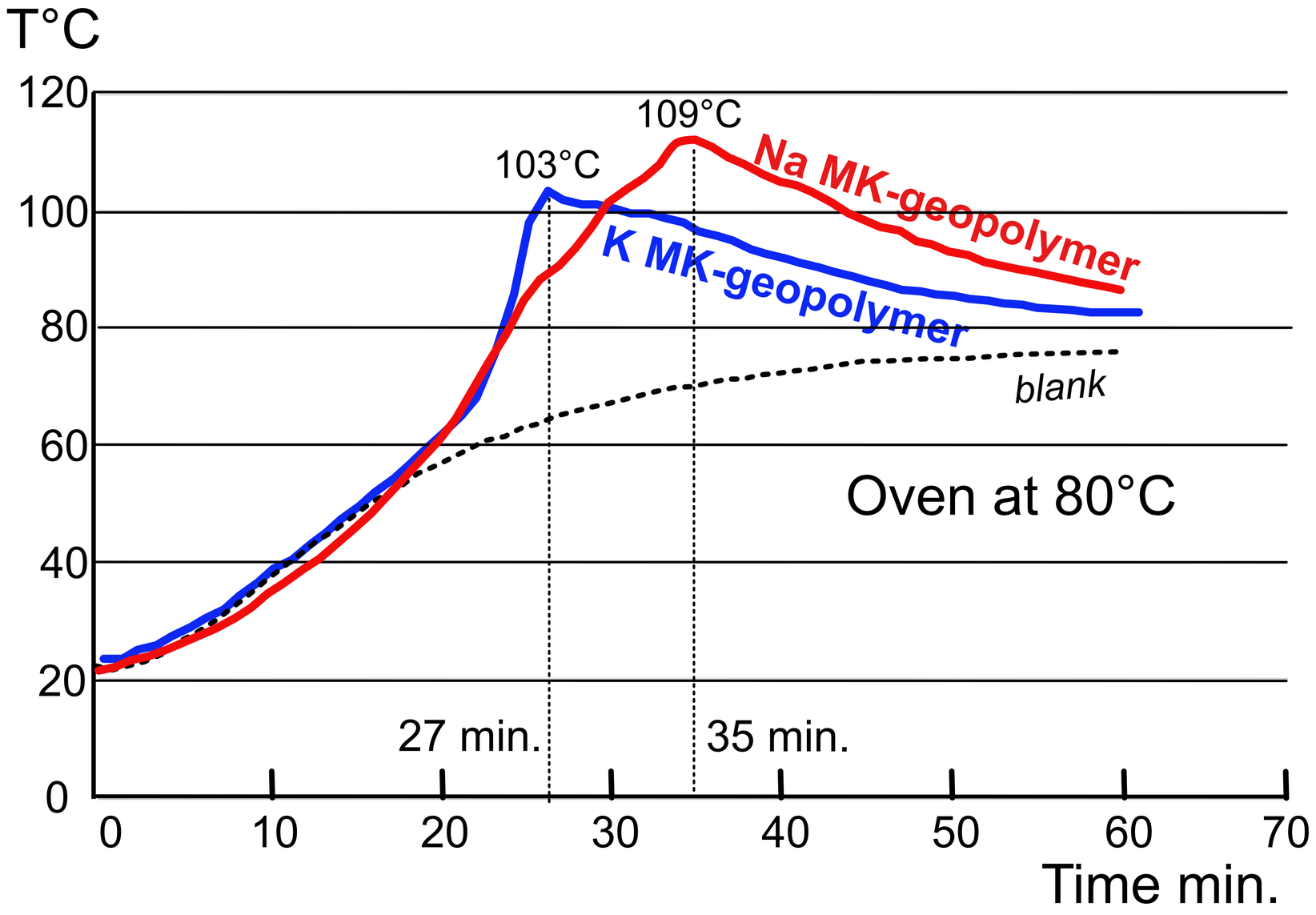
Testing of 10 commercial metakaolins

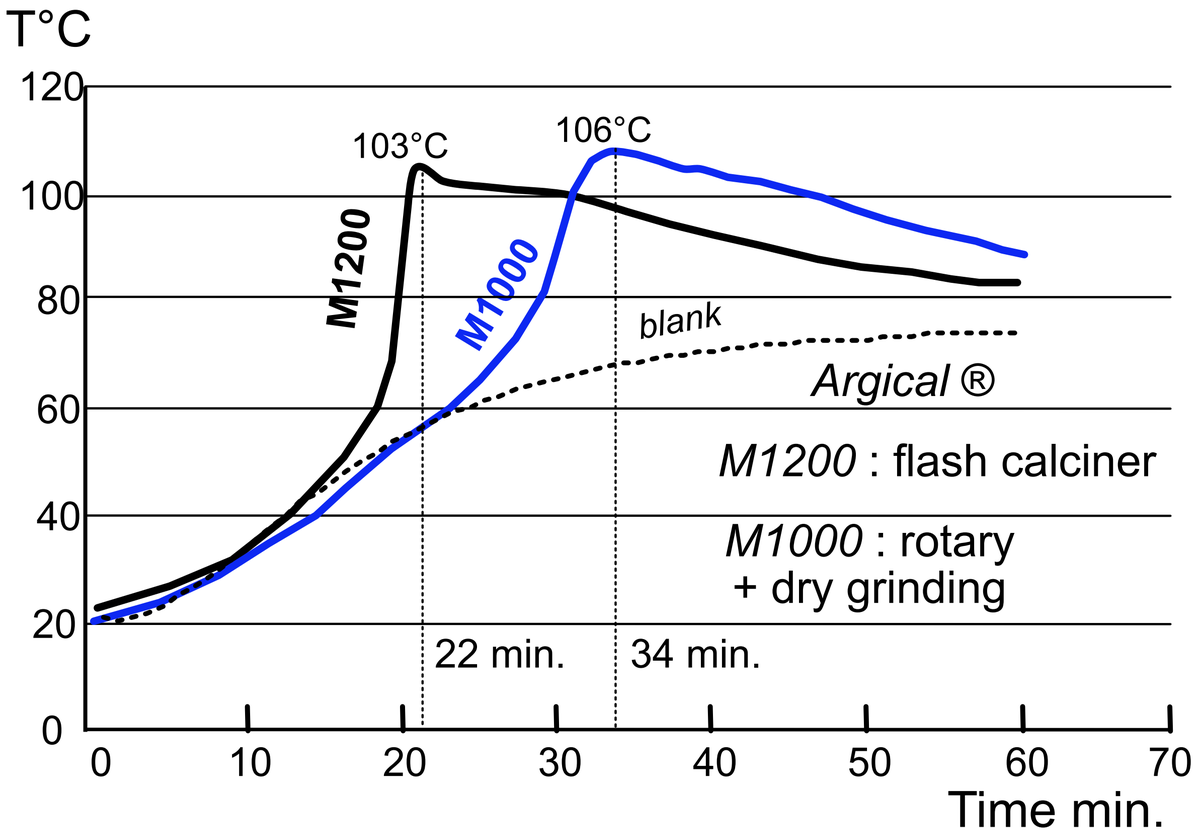
Exothermicity, reactivity

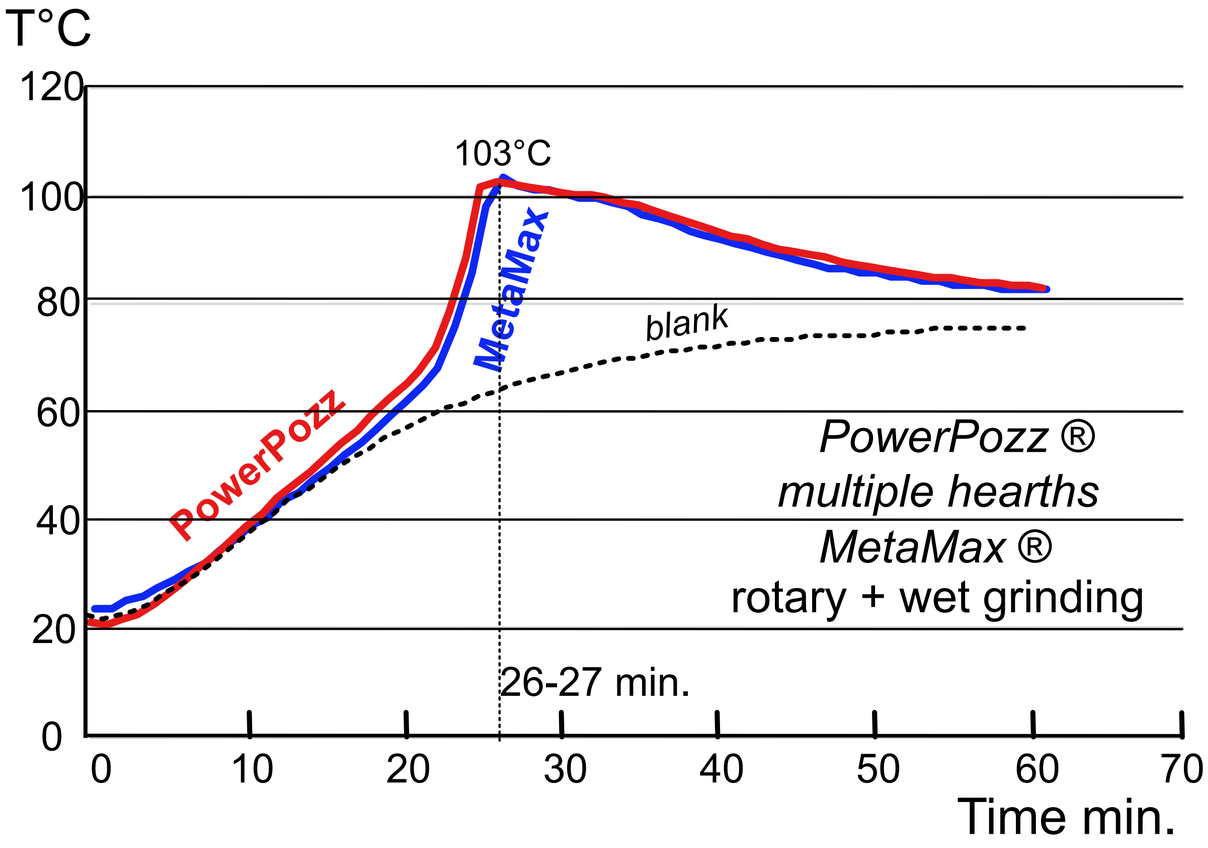


K silicate and Na silicate solutions, MR=1.7

(MK *MetaMax*)

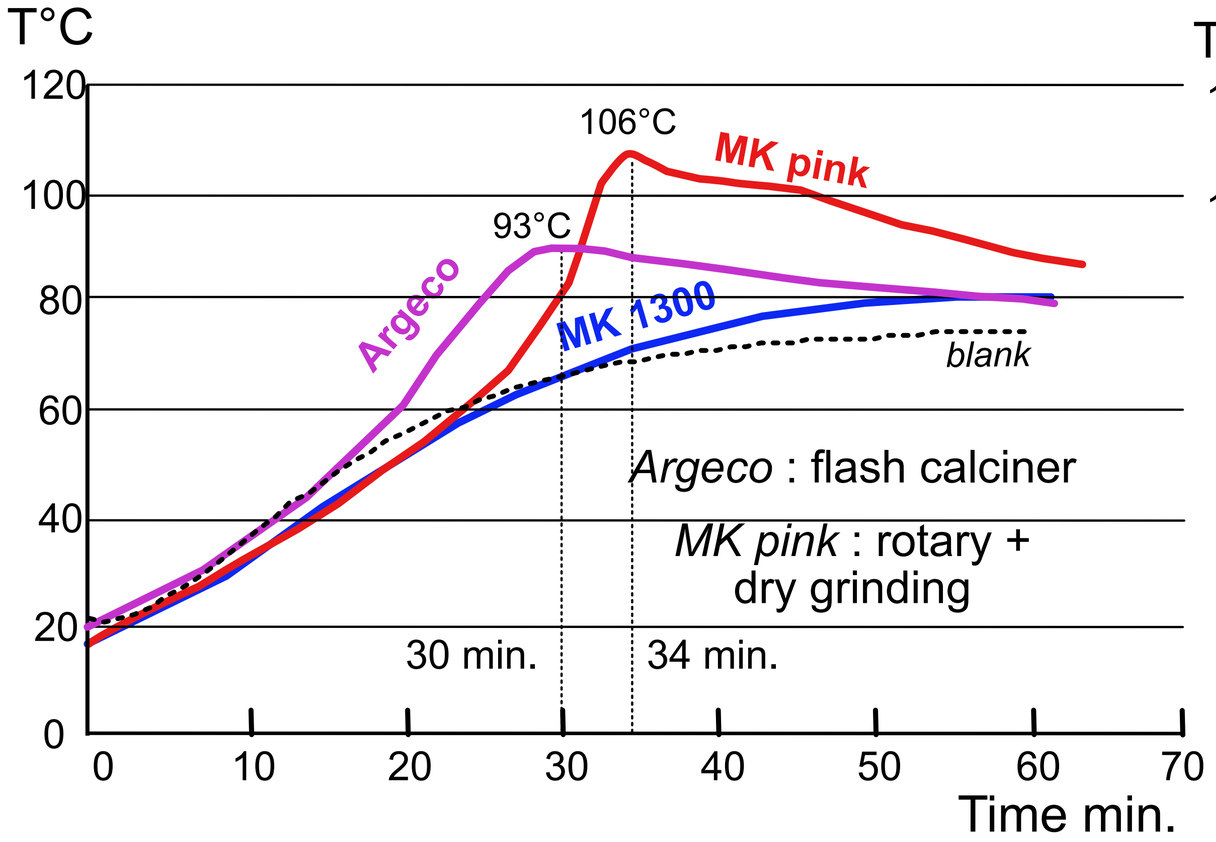


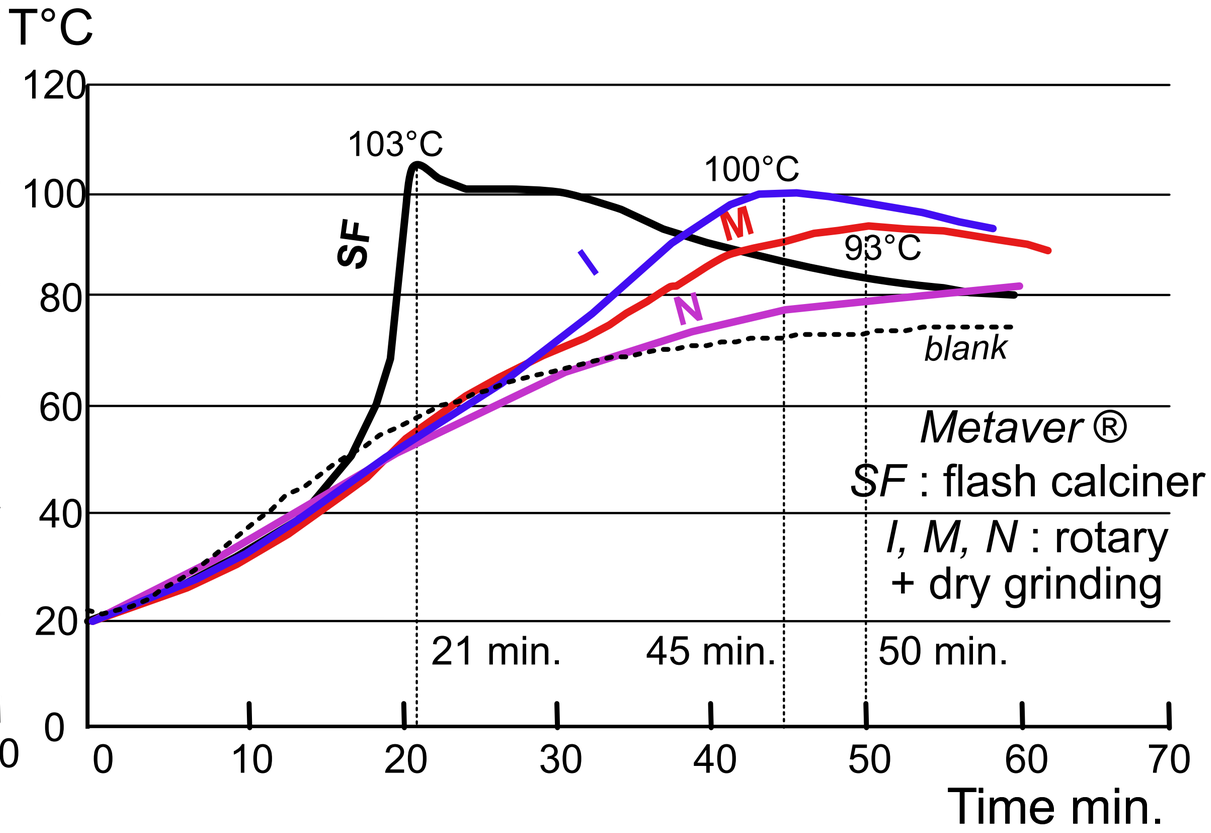




Argical M1200, M1000, same geological sources (Clerac, France) and different calcining methods: flash and rotary.

PowerPozz, MetaMax, same geological sources (Georgia, USA), and different processing methods (multiple hearths and wet grinding).





MK pink, *MK 1300, MK Argeco,* different geological sources and different calcining methods: flash and rotary.

Metaver SF, I, M, N: same supplier, different geological sources and calcining methods.

Exothermic data for eleven commercial MKs:

- time in minutes at exothermic maximum,
- temperature at maximum measured during curing at 80°C,
- calcination method.
- pozzolanic activity (data from suppliers) .

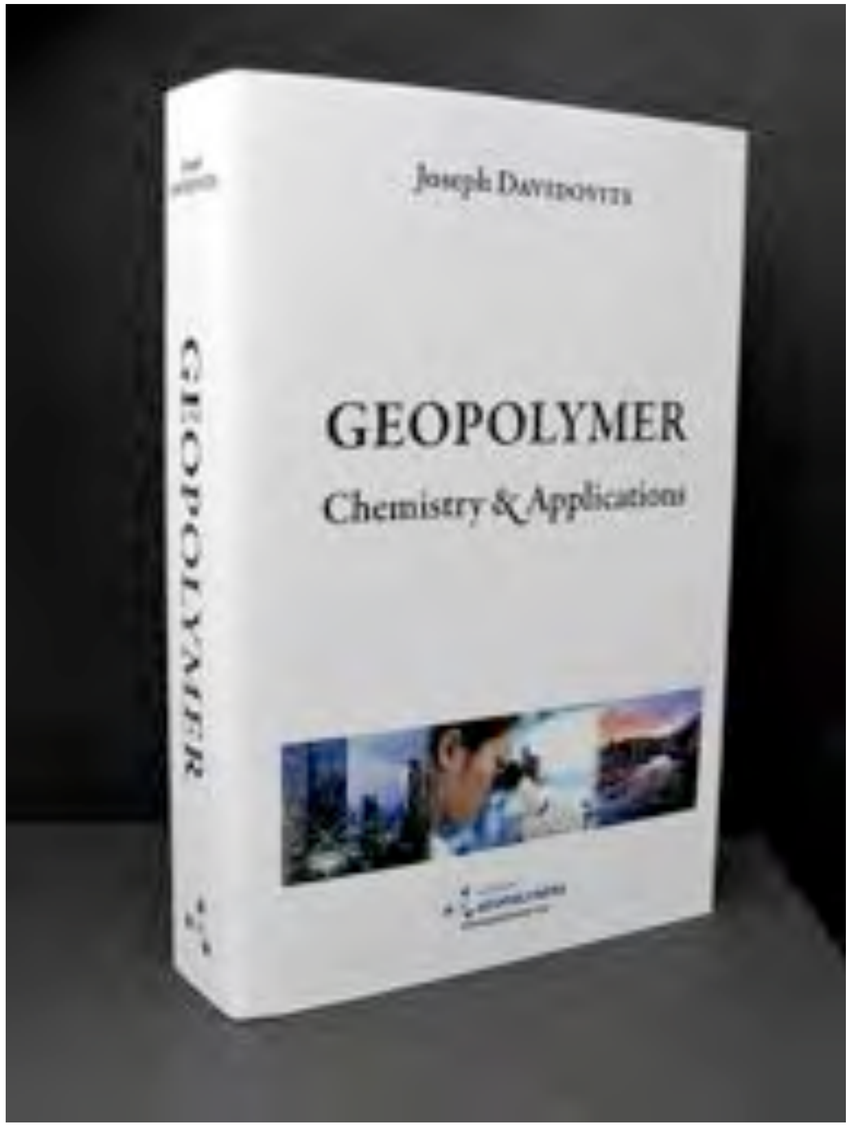
	Time min. exo max	T°C max	Pozzolanic activity*	Calcination method
Metaver SF	21	103	1280*	Flash
Argical M1200	22	103	1370*	Flash
Powerpozz	26	103	rapid	Herreshoff
MetaMax	27	103	-	Rotary +
MK Argeco	30	93	-	Flash
Argical M1000	34	106	1150*	Rotary
MK Pink	34	106	-	Rotary
Metaver I	45	100	rapid	Rotary
Metaver M	50	93	very rapid	Rotary
Metaver N	>60	82	rapid	Rotary
MK 1300	>60	80	-	Rotary

* Chapelle test.

Standard on geopolymer resistance to acids

With respect to acid resistance and the associated leaching testing, we have been faced with a dilemma due to the absence of an appropriate standard procedure.

We decided to fix the conditions of acidic attack to 5 % acid weight concentration, and room temperature.



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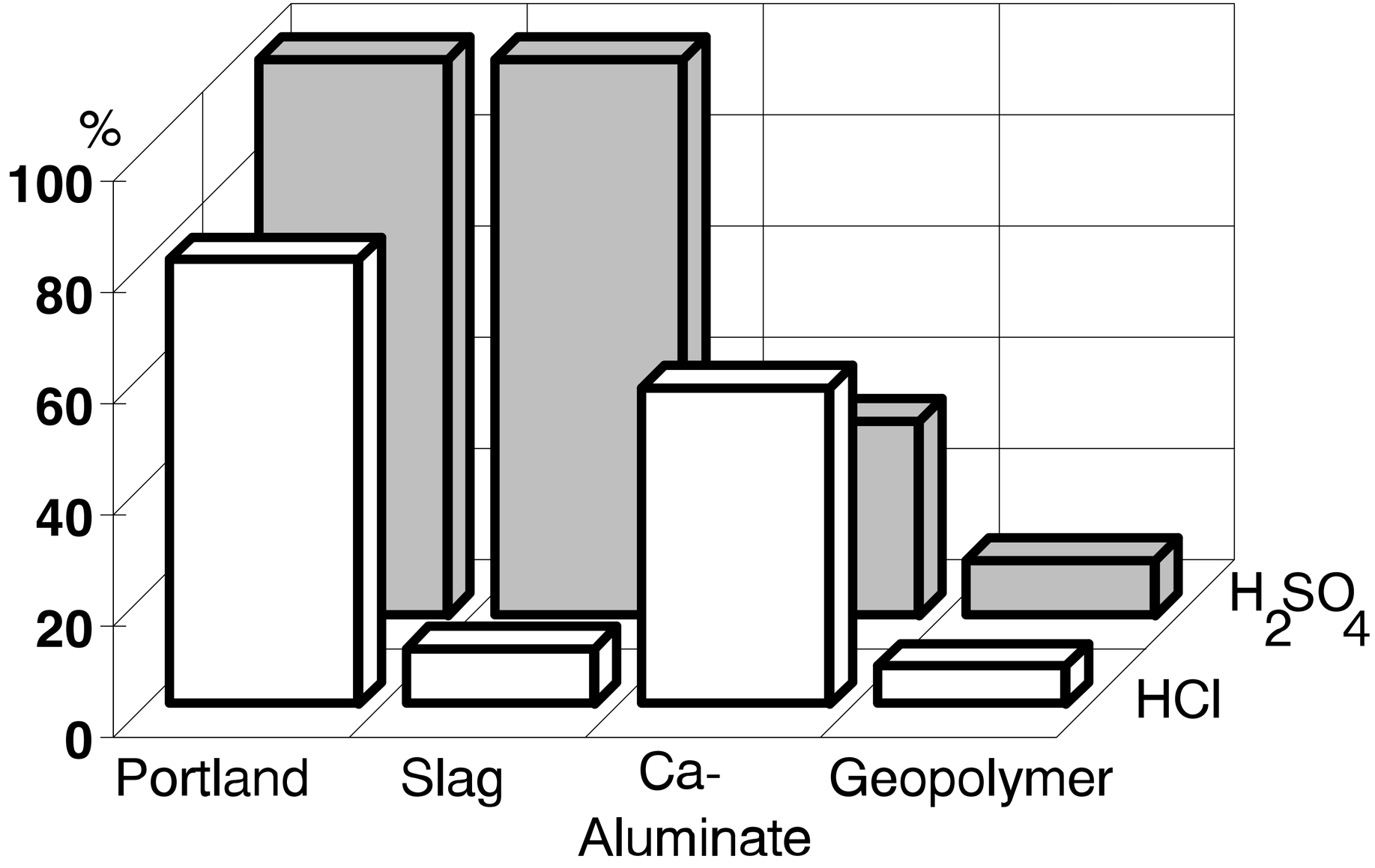
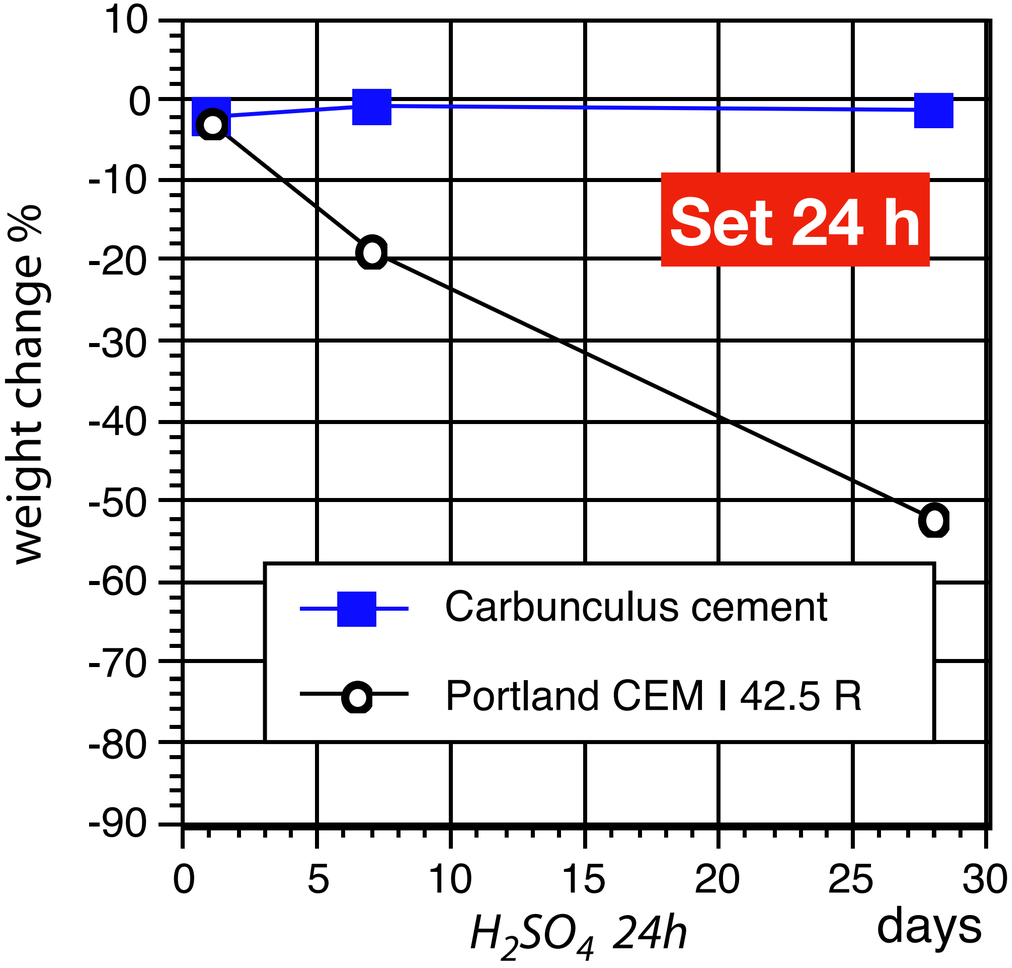
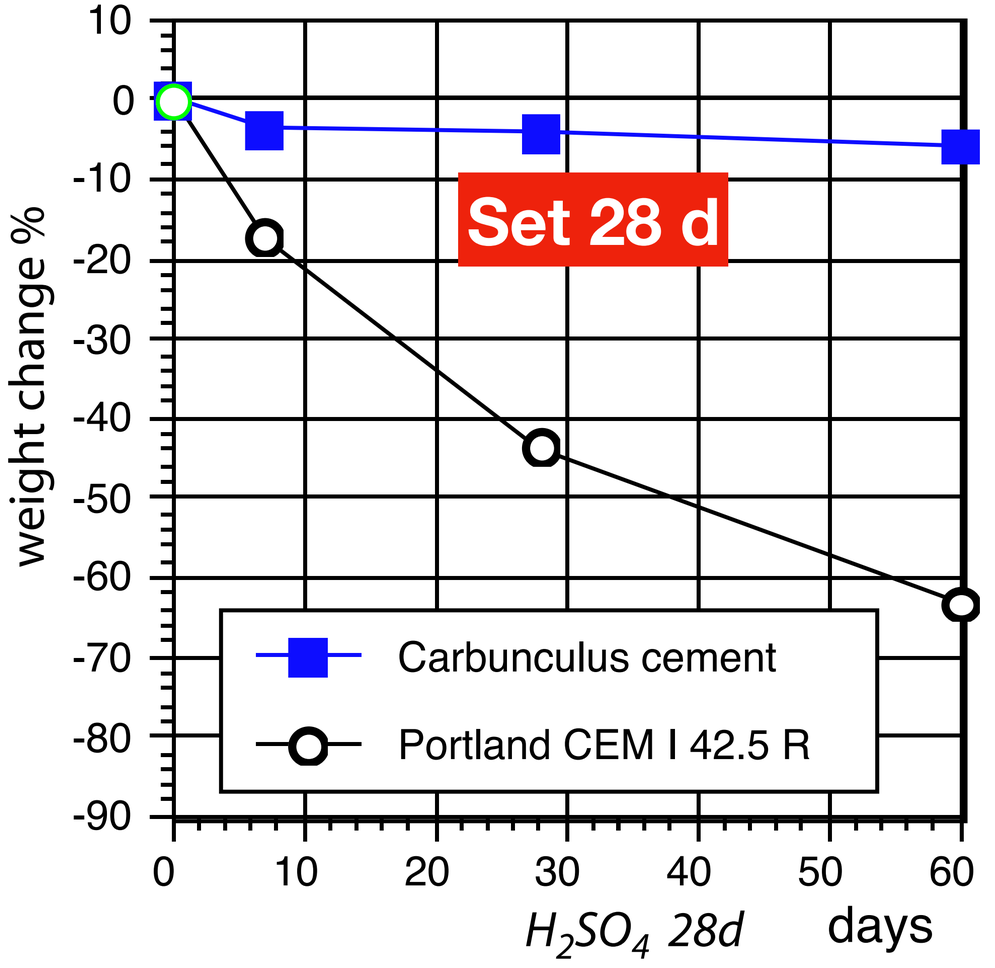


Break up, weight %, in 5 % acid solution (Davidovits, 1993).

MK / Slag-based geopolymer cement vs. Portland cement



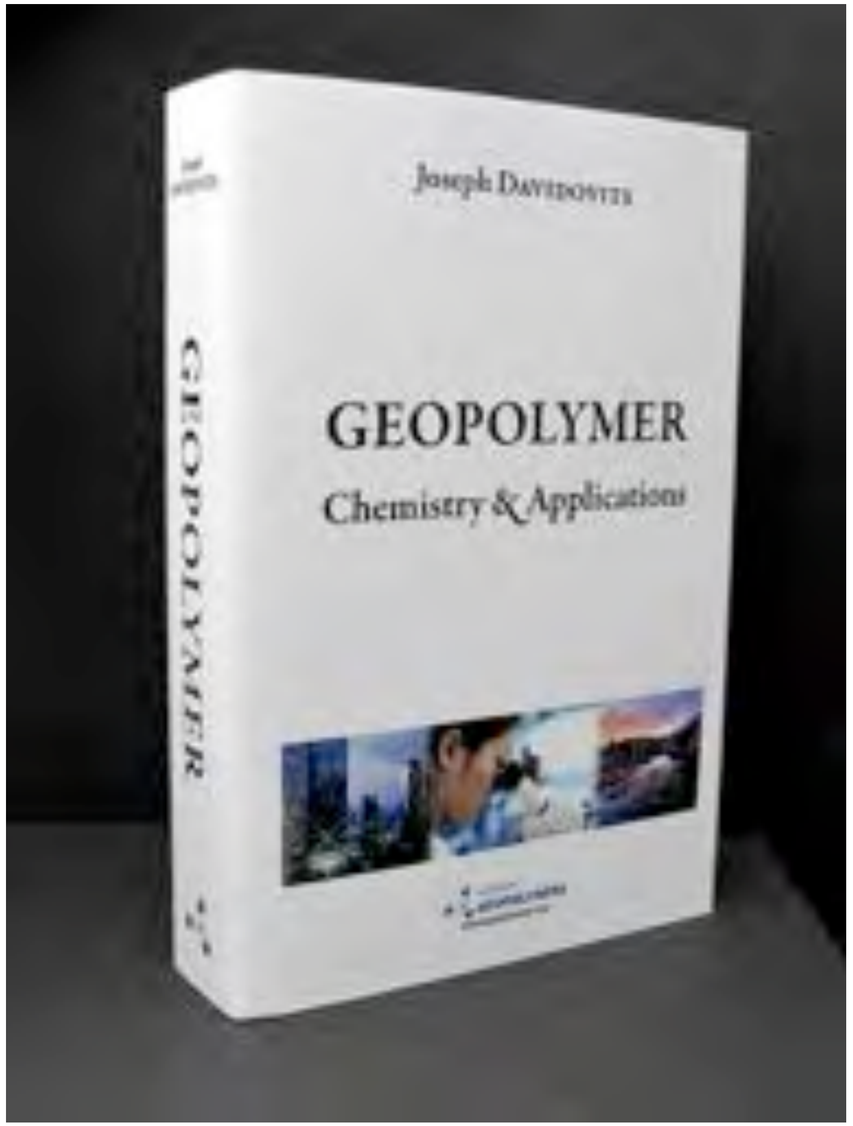


Sulfuric acid solution (5 %).

Other standard projects

Fire resistance and Heat resistance

Geopolymerization / hardening:
Boiling water
wet / dry



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