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2 **Supplementary Material**

3 **Synthesis and characterization of amorphous precipitated silica from alkaline**

4 **dissolution of olivine**

5 **Nadeem Raza,[a,b] Waseem Raza,[c] Silvia Madeddu,[a] Henry Agbe,[a] R.V. Kumar,[a]**

6 **Ki-Hyun Kim*[d]**

7 [a]*Department of Material Science & Metallurgy, University of Cambridge United*
8 *Kingdom;*[b]*Govt. Emerson College, affiliated with Bahauddin Zakariya University, Multan;*
9 *[c]State Key Laboratory of Fine Chemicals, School of Chemical Engineering, Dalian*
10 *university of Technology, Dalian, Liaoning, 116024 China;*[*d]*Department of Civil and*
11 *Environmental Engineering, Hanyang University, Seoul 04763, Korea*

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15 **Table S1.**Chemical analysis of olivine

Serial #	Component	[Wt.%]
1	MgO	40.0
2	Fe_2O_3	9.5
3	Al_2O_3	0.7
4	CaO	0.4
5	SiO_2	39.0
6	Loss on ignition	11.4 %

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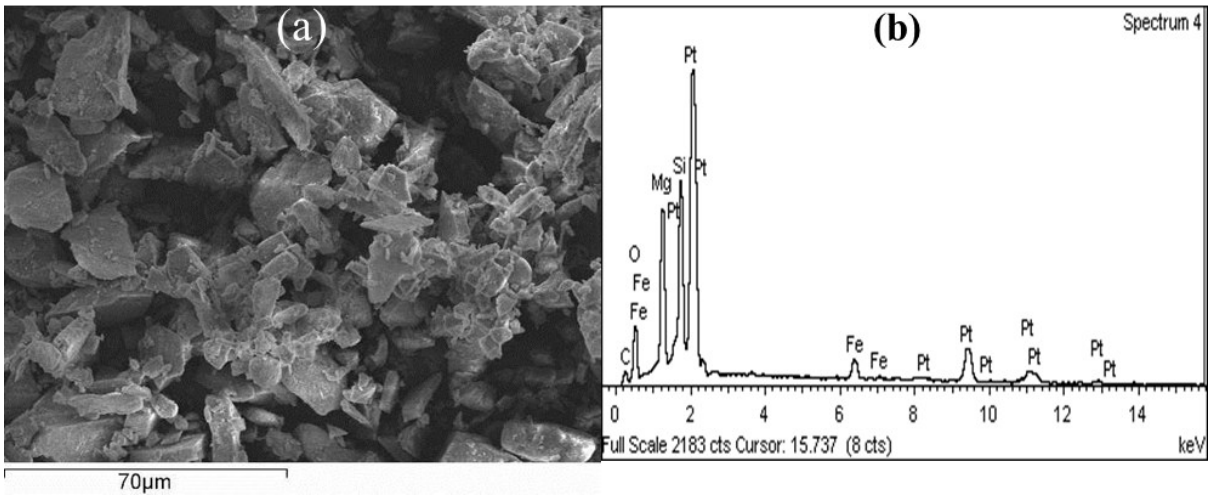
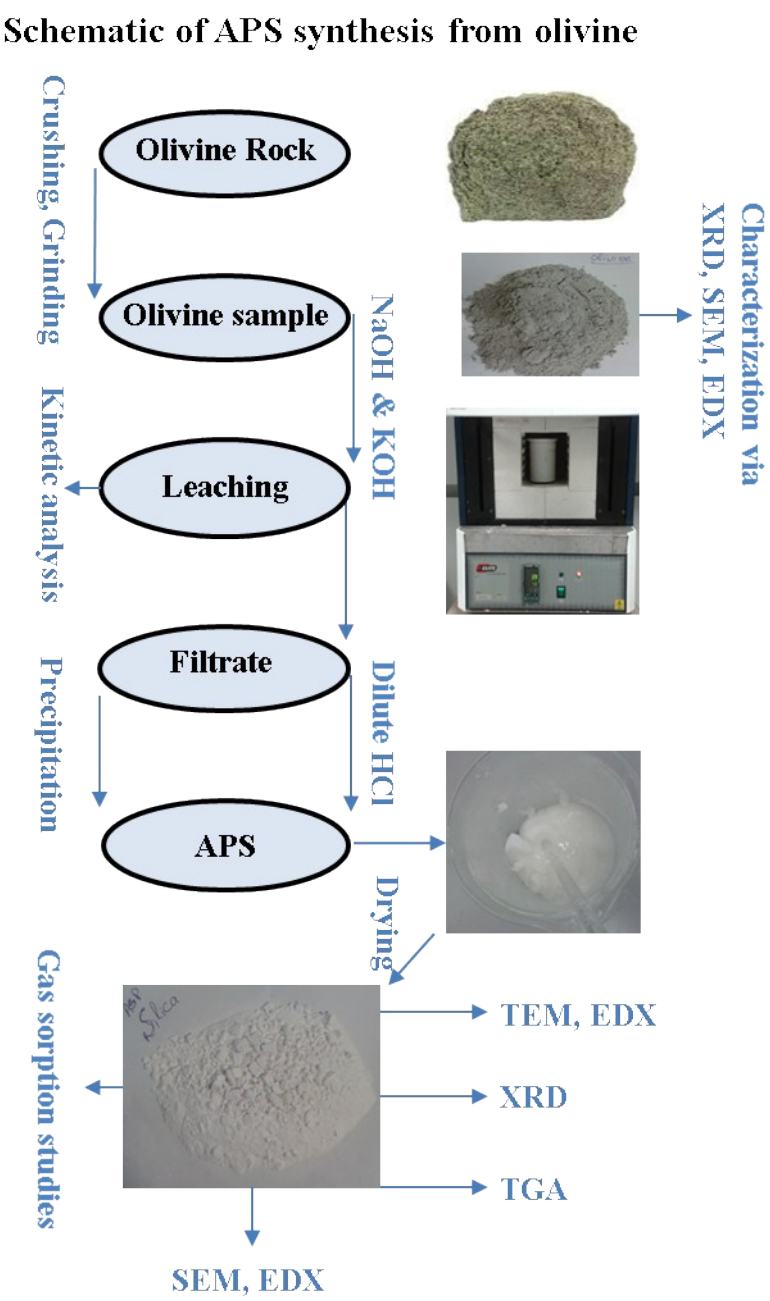


Fig. S1 Morphological characteristics of ground olivine(a)SEM image (b) EDX spectrum



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25 **Fig. S2** Schematic of APS synthesis from olivine using alkaline dissolution.

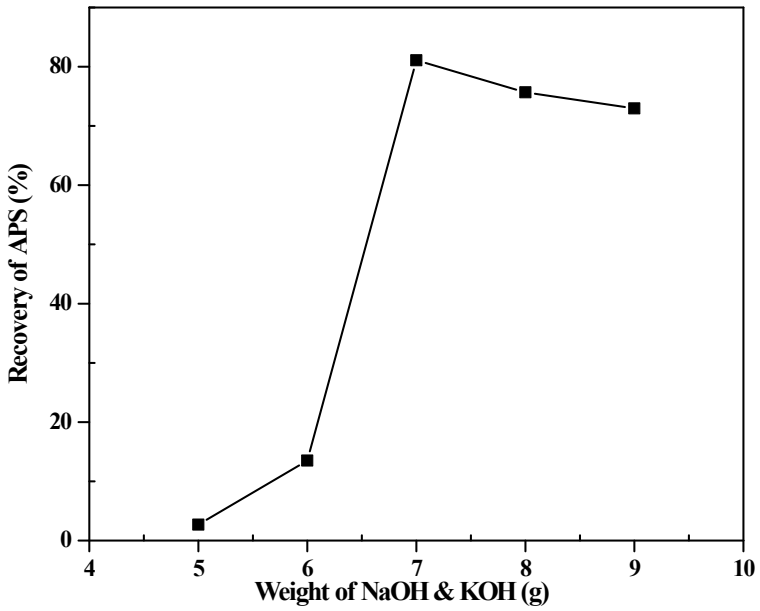


Fig. S3 Effect of concentration of NaOH and KOH on the leaching of silica from olivine (Temperature 170ºC, H_2O content 0.8 mL, and reaction time 5 h for 10 g olivine).

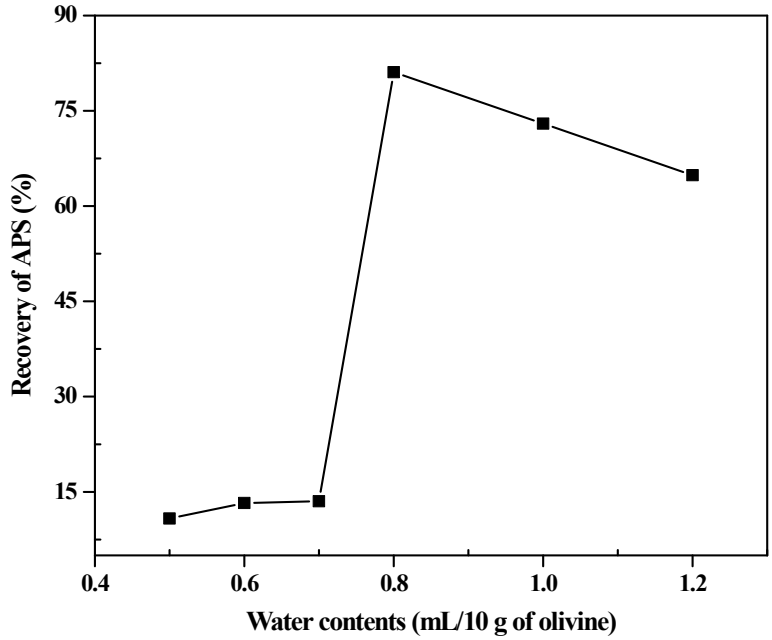


Fig. S4 Effect of water content on the leaching of silica from olivine (Temperature 170 ºC, mass of bases 14 g, reaction time 5 h for 10 g olivine).

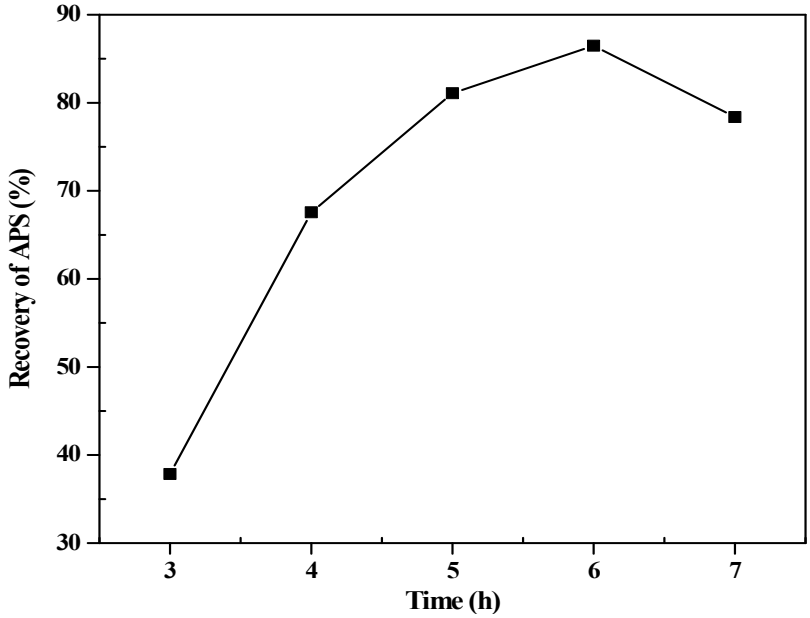


Fig. S5 Effect of reaction time on leaching of APS from olivine (Temperature 170 °C, H_2O content 0.8 mL, mass of bases 14 g for 10 g olivine).

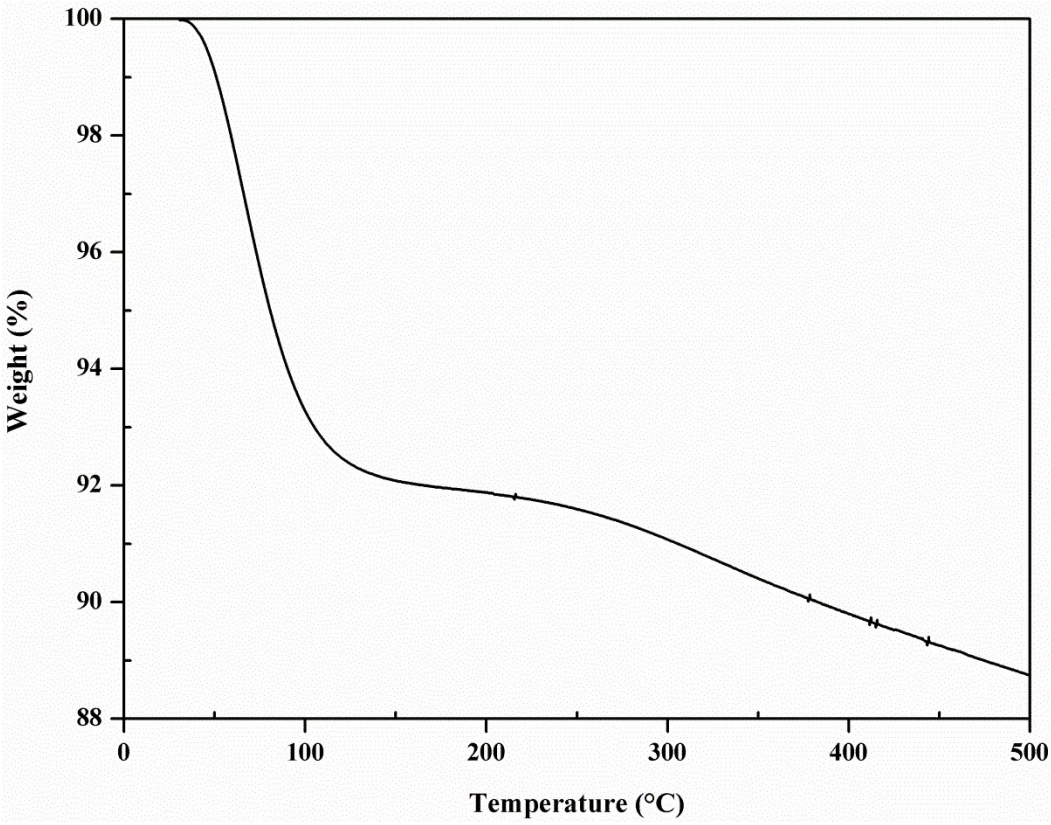
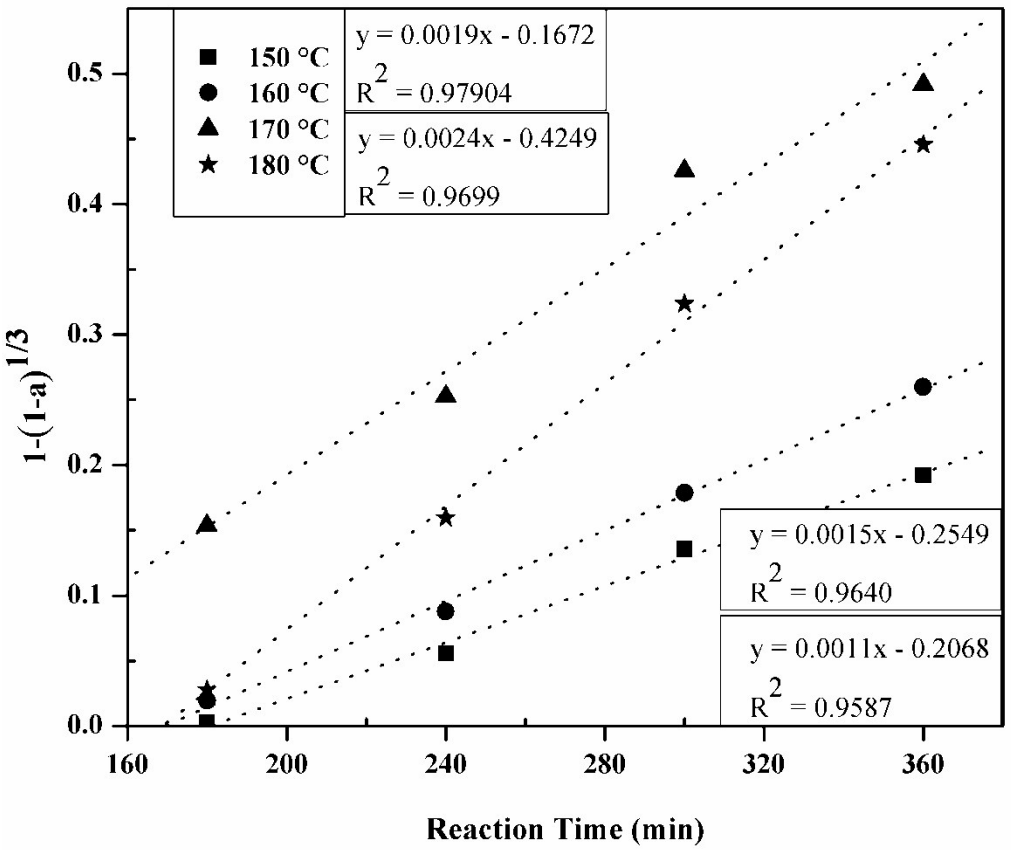


Fig. S6 TGA curve of APS.



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43 **Fig. S7**A plot of$1-(1-\alpha)^{1/3}$vs.reaction time.

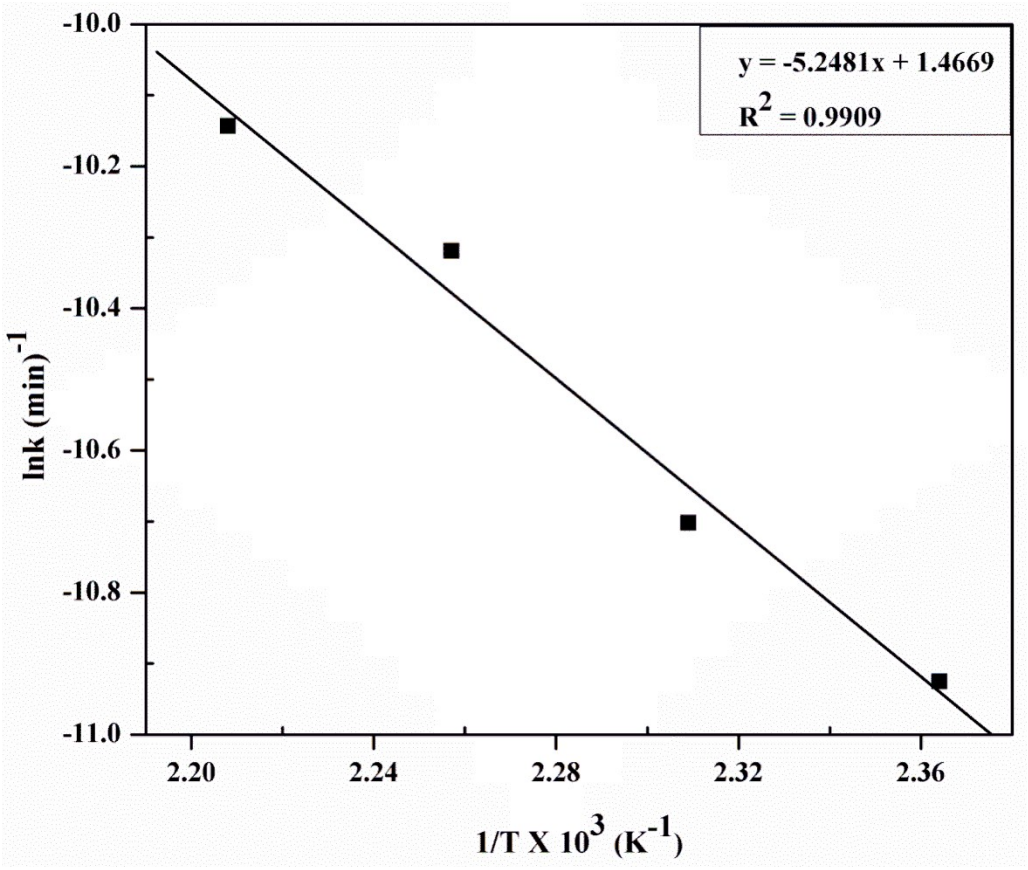

Fig. S8 Arrhenius plot.