

Supporting online material to:

Extraction of Microplastic from Biota: recommended acidic digestion destroys common plastic polymers

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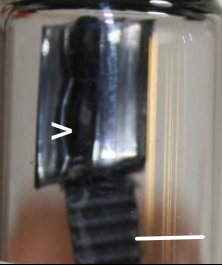
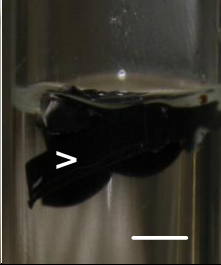
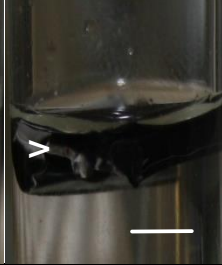

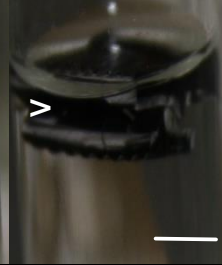
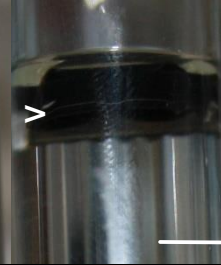

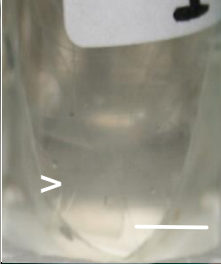
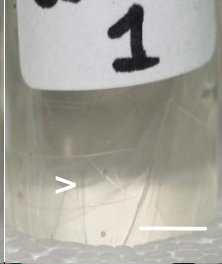
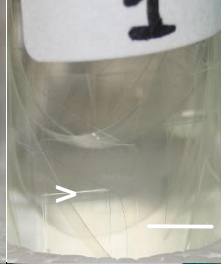
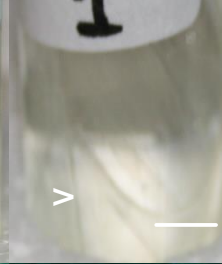
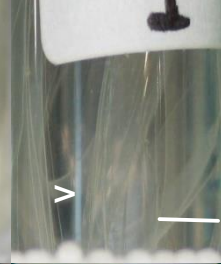
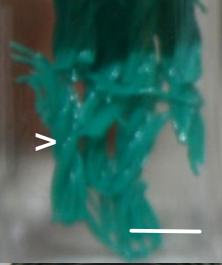






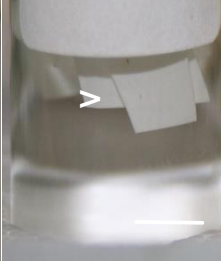
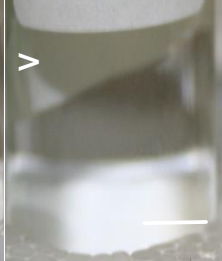
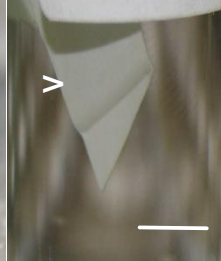
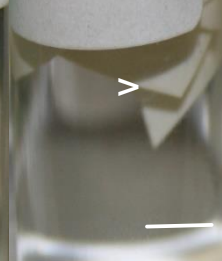
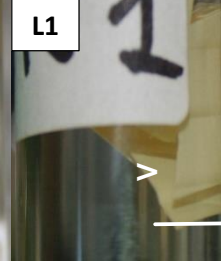
^b Copenhagen University, Nørregade 10, 1165 København, Denmark

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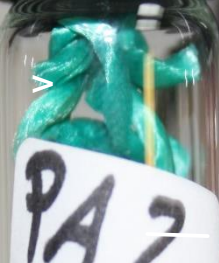
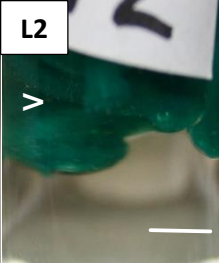
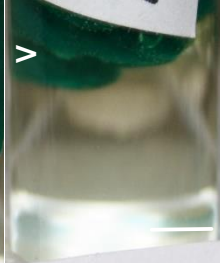
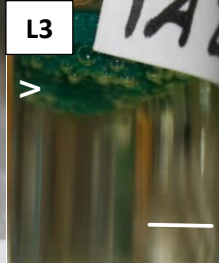
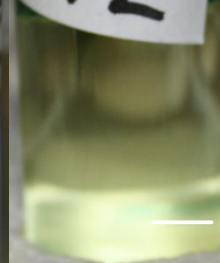
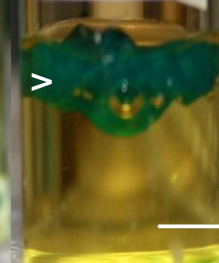
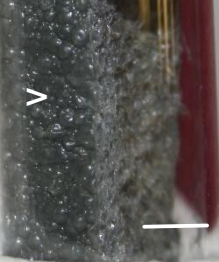
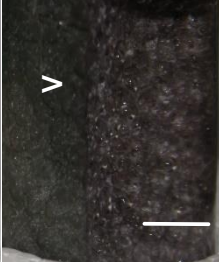
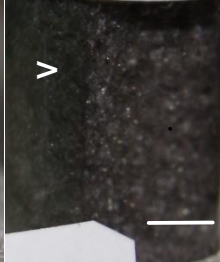
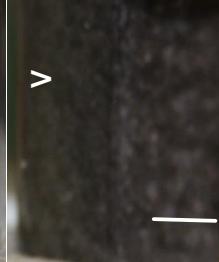
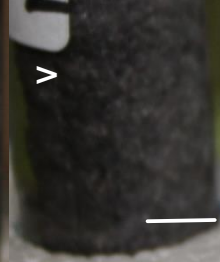
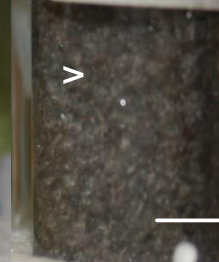

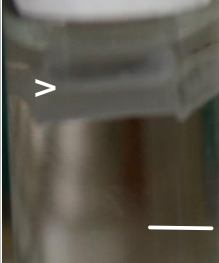
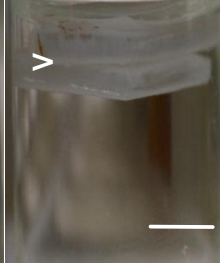
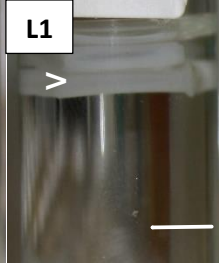
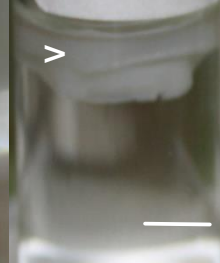
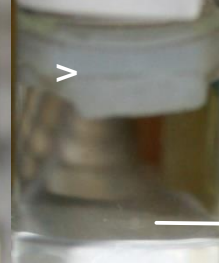

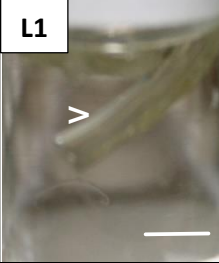
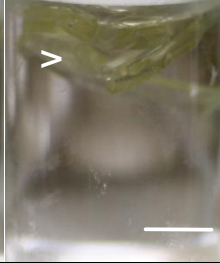
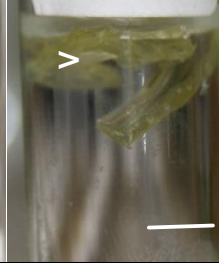

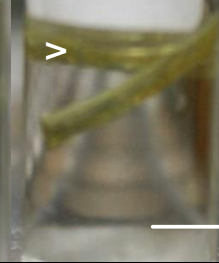
Supplement 1: Time series images of the digestion processes. Image series showing the gradual effects of $\text{HNO}_3:\text{HClO}_4$ to the respective plastic representative. White arrows point at the plastic item. Scale bars equal 0.5 cm. The images in one row always show the same item, sometimes with a slightly changed view angle.

Supplement 2: Exemplary Raman spectra showing impacts of digestion chemicals. Spectra of each polymer are given in the order (from top to bottom): reference, after acidic treatment, after KOH treatment, after treatment with 30% dilution of KOH : NaClO 1:1 mixture. Missing spectra could not be measured due to severe degradation during digestions (i.e. complete dissolution).


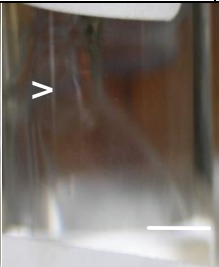
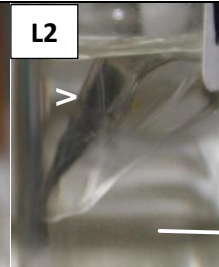
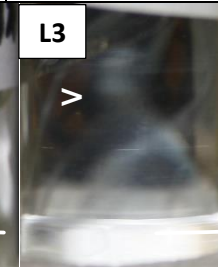
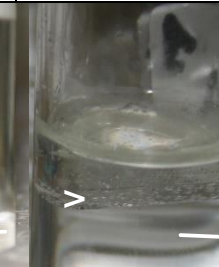
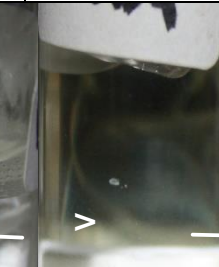



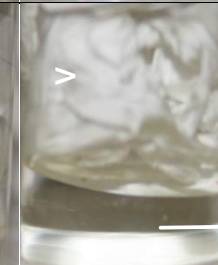



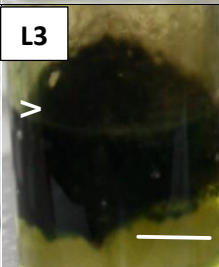
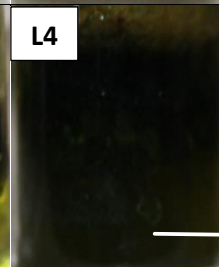
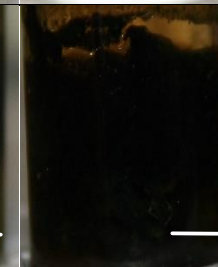
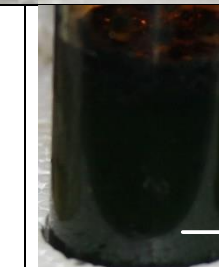

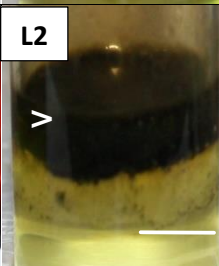
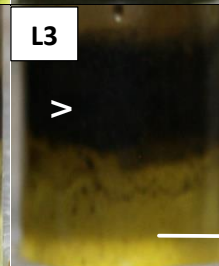
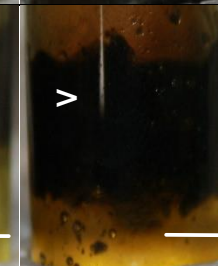
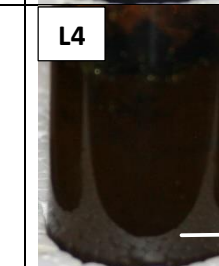
Supplement 1: Macroscopic impact of the the acid mix treatment $\text{HNO}_3:\text{HClO}_4$ (4:1)


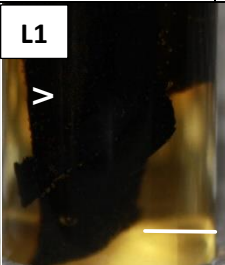
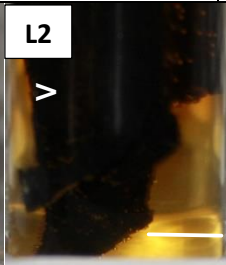

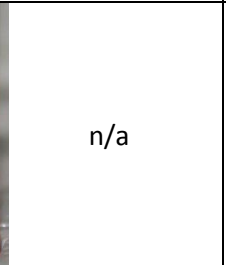
Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
PP							No effect observed
LD PE							No effect observed
HD PE							No effect observed
PS							Yellowing after heat, solute stays clear

Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
EPS							Slight yellowing after heat, solute stays clear
ABS							Darkening of original blue colour, later bleaching (greyish) and sponge-like bloating
PU							
PA							Complete dissolution within seconds to minutes

Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
PA							Melting-like behaviour
EVA							No effect observed
PET							Transparency blurred
PC							Slight yellowing

Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
Nitrite							
PVC 1							Leaching of dark colourant into solute, after 10 hours more softened appearance
PVC 2							
PVC 3							Slightly softened appearance after 10 h and 80°C

Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
PMMA							Beginning dissolution creates mucous layer particle
PTFE							No effect observed
RE 1					n/a		
RE 2					n/a		

Type of plastic	Before trial	30 min	1 hour	5 hours	10 hours	20 min a 80°C	Comments
RE 3		L1 	L2 	L3 	n/a	L4 	

Supplement 2

Raman spectra of untreated plastics and after exposure to digestion treatments.

List of spectra:

Figure S1: Polypropylene (PP)

Figure S2: Polyethylene (PE)

Figure S3: Polystyrene (PS)

Figure S4: Acrylonitrile butadiene styrene (ABS)

Figure S5: Polyamide (PA)

Figure S6: Polyethylene terephthalate (PET)

Figure S7: Polycarbonate (PC)

Figure S8: Polyvinylchloride (PVC)

Figure S9: Polymethyl methacrylate (PMMA)

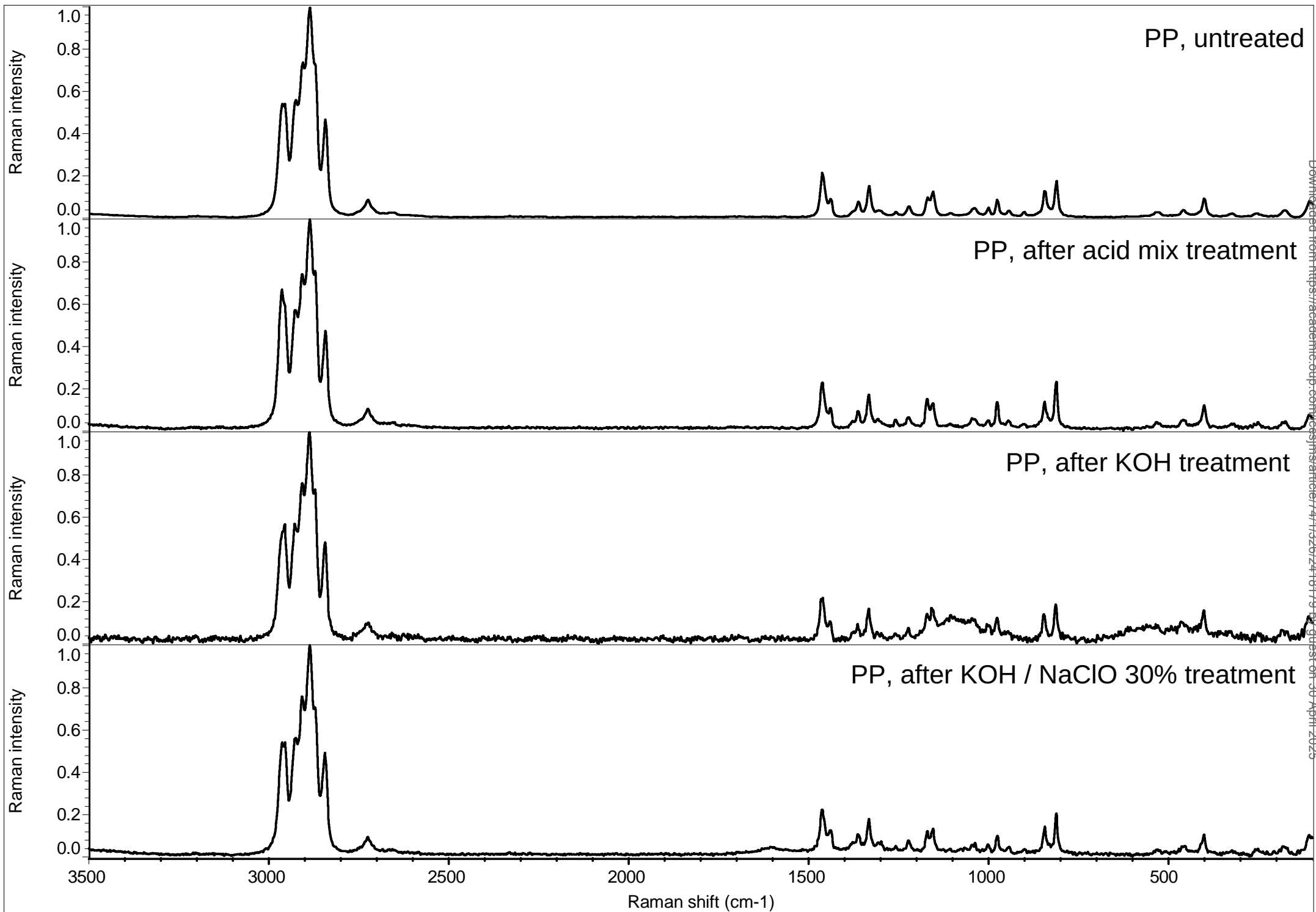


Figure S1: Spectra of polypropylene

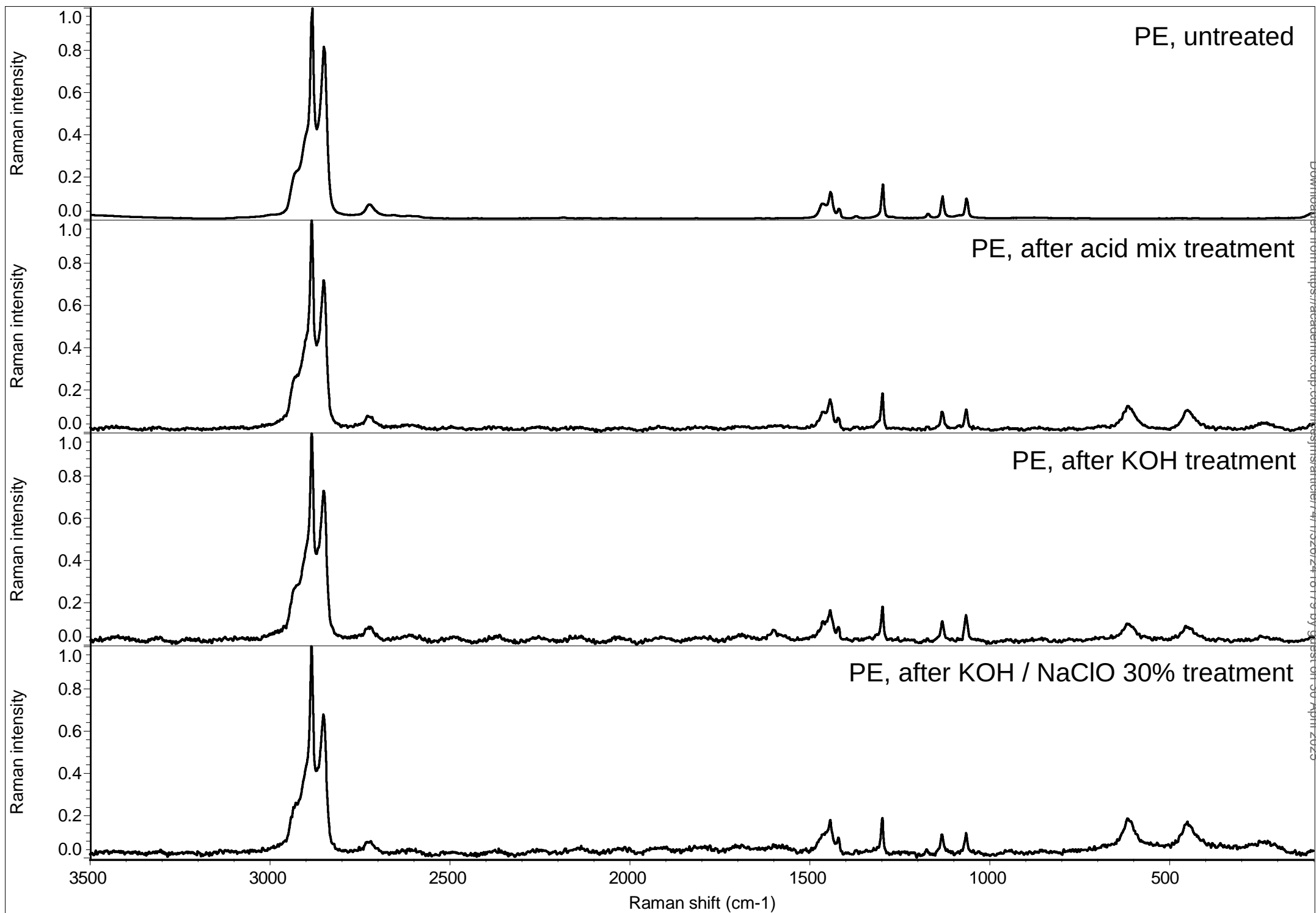


Figure S2: Spectra of polyethylene

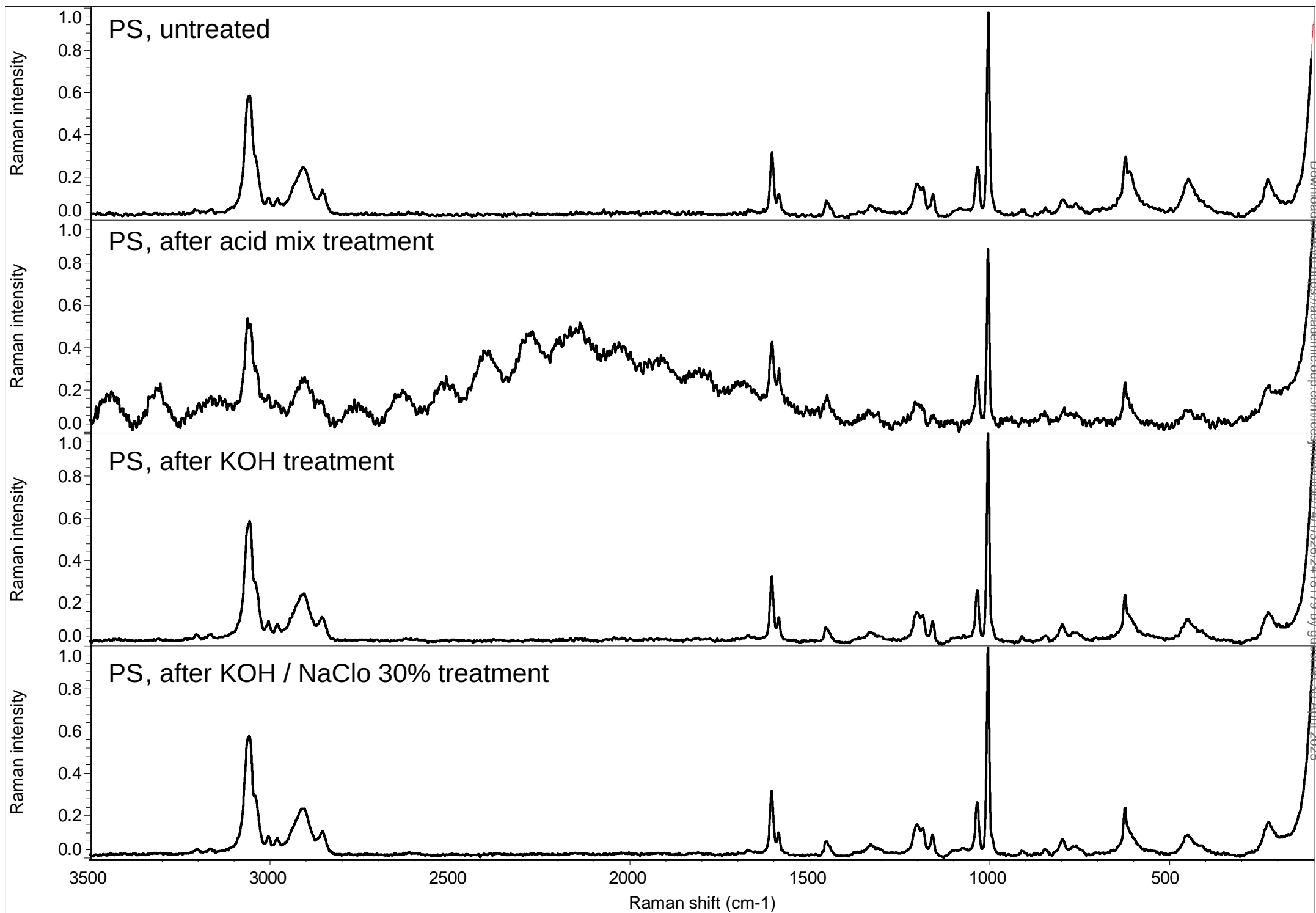


Figure S3: Spectra of polystyrene

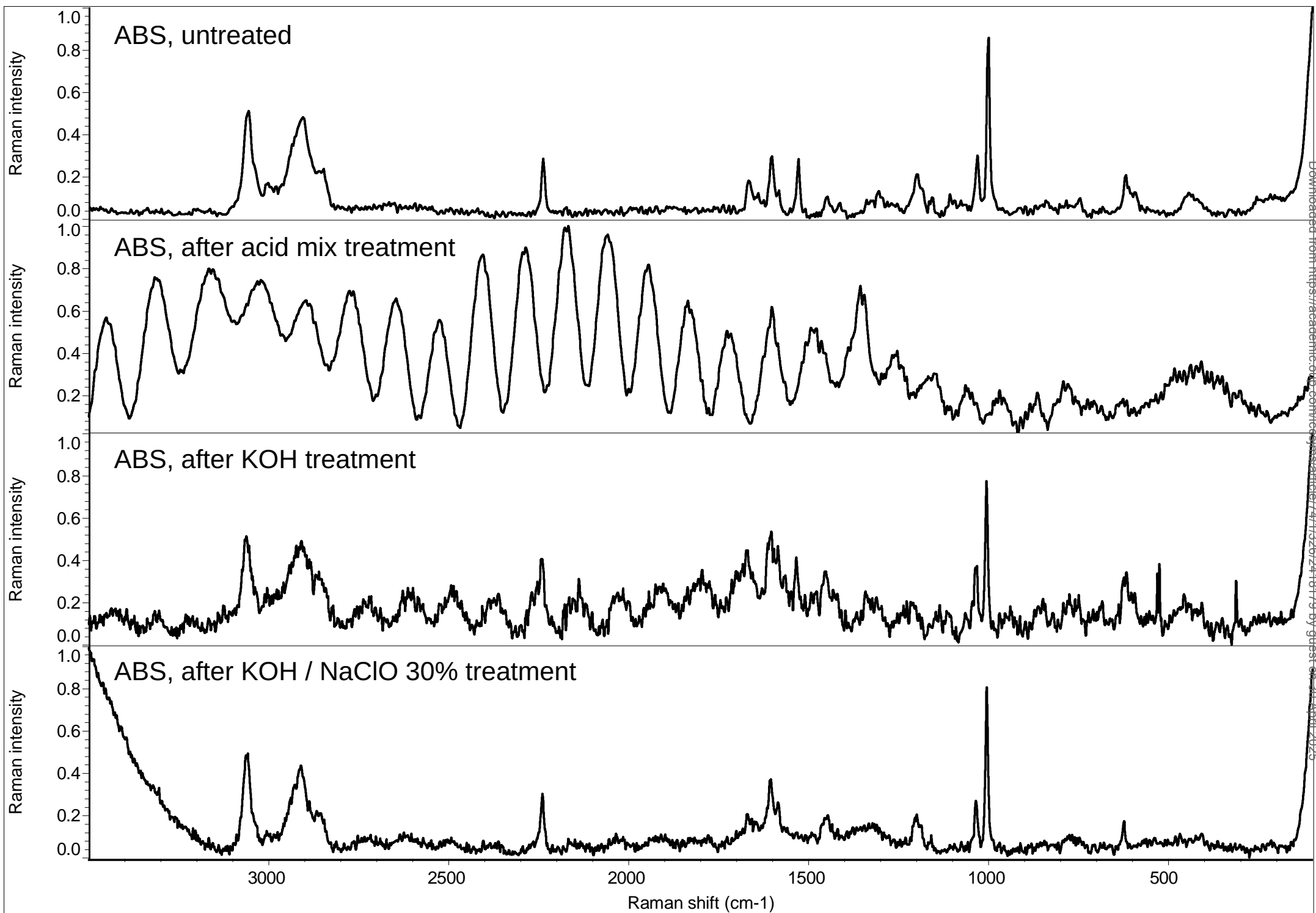


Figure S4: Spectra of acrylonitrile butadiene styrene

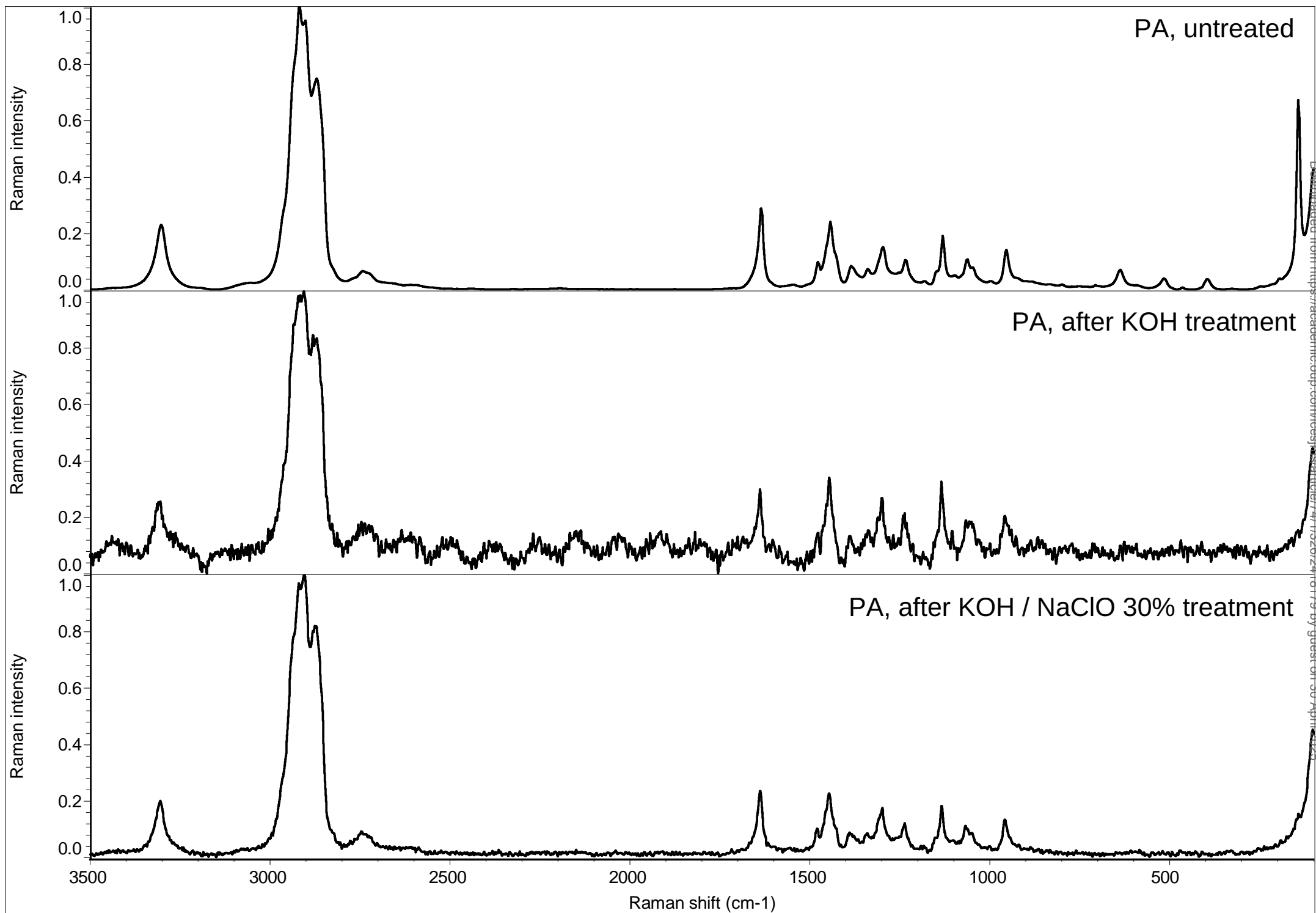


Figure S5: Spectra of polyamide

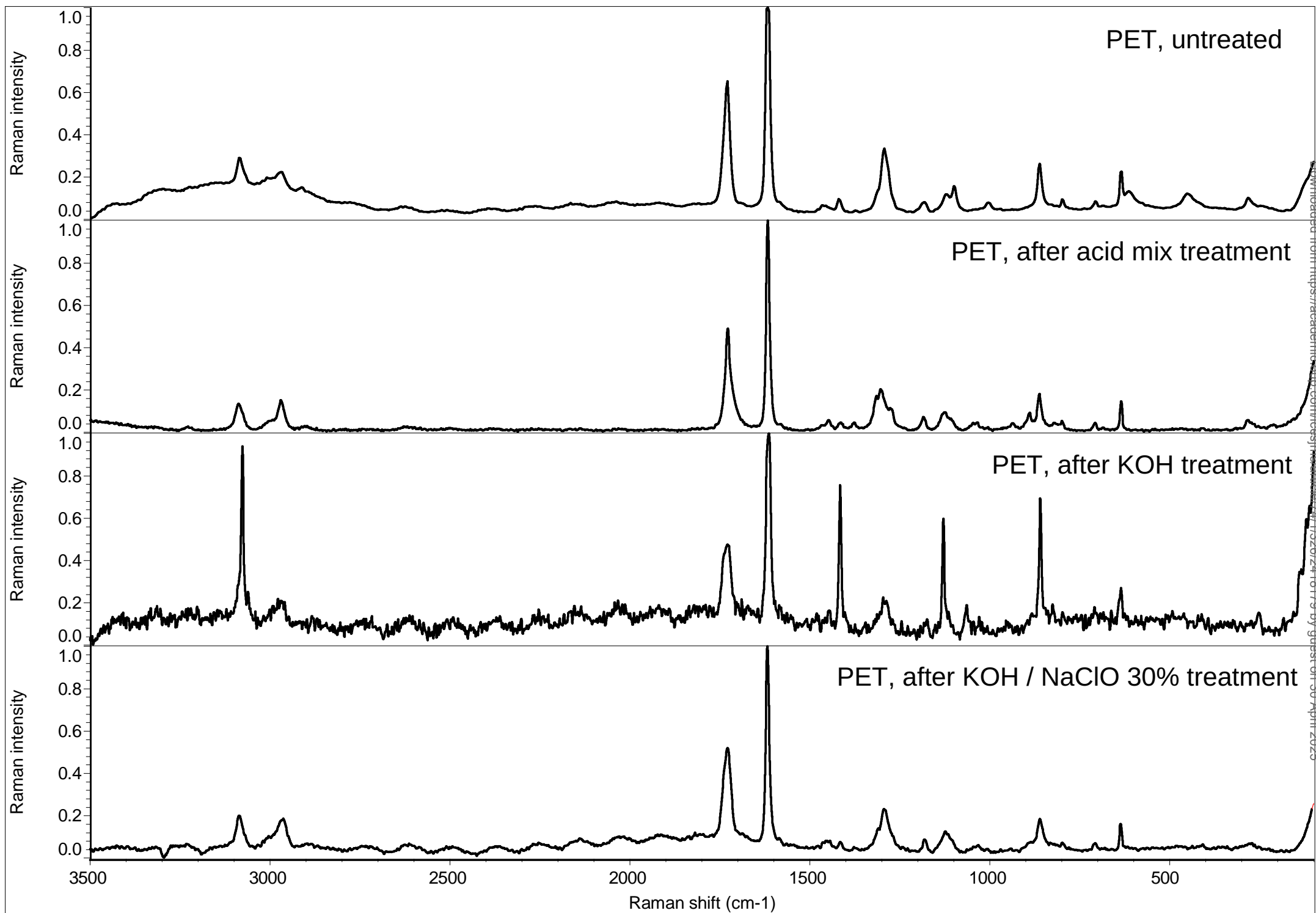


Figure S6: Spectra of polyethylene terephthalate

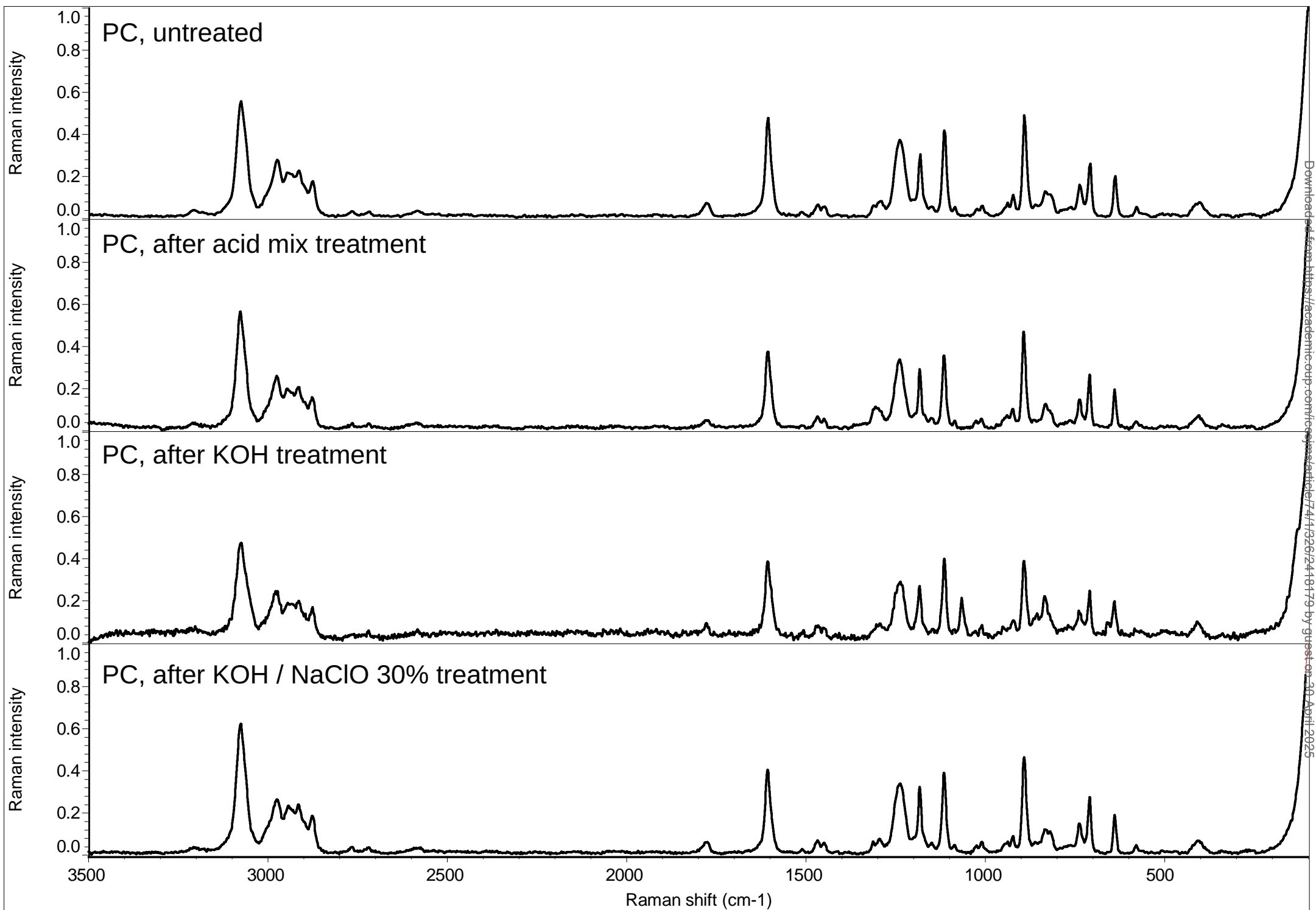
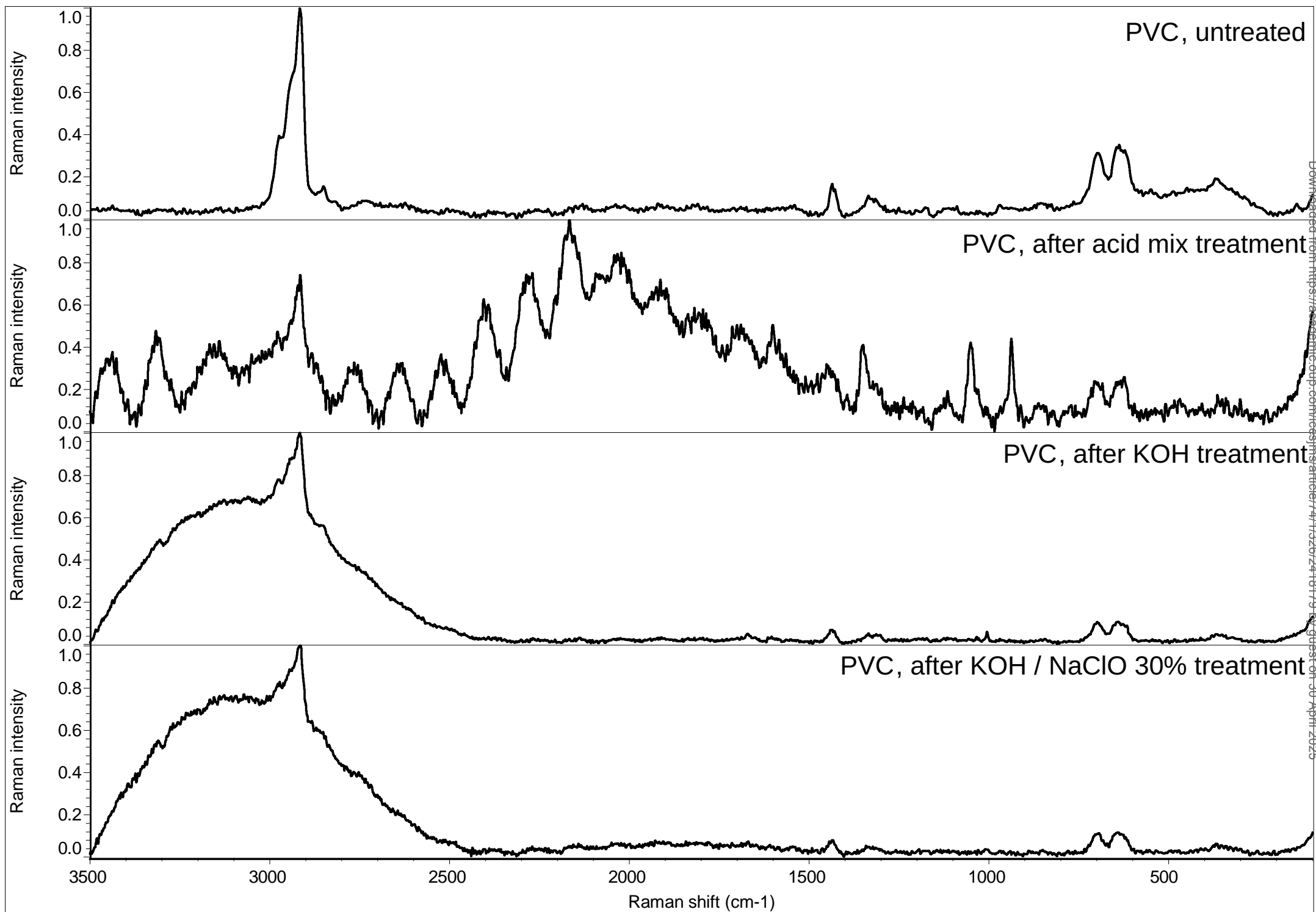


Figure S7: Spectra of polycarbonate



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Figure S8: Spectra of polyvinylchloride

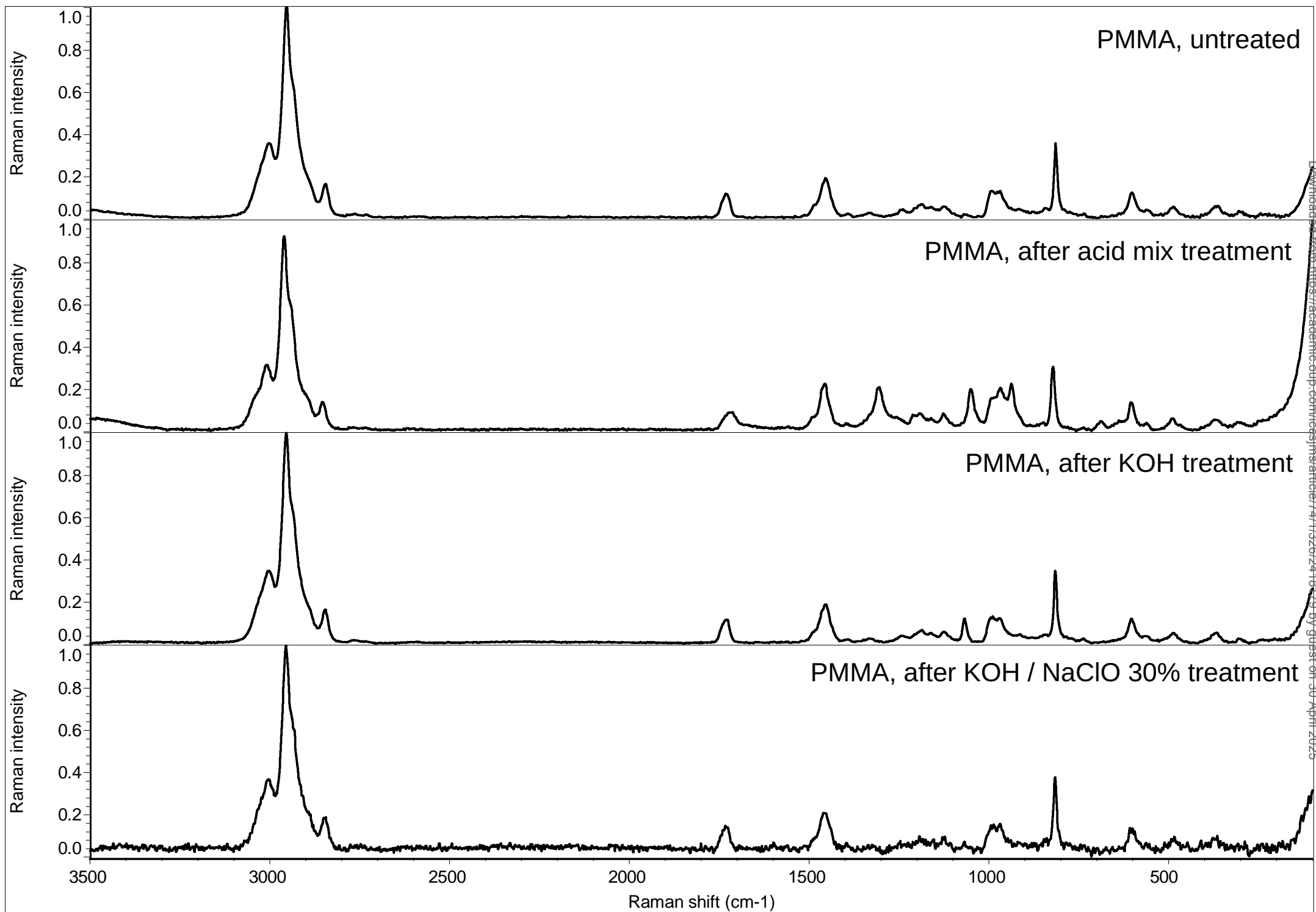


Figure S9: Spectra of polymethyl methacrylate