



1.7. Analytical techniques table

A table for polymer identification was set up to assist conservation scientists, conservators and technicians in choosing analytical techniques to optimise research into the identification of plastics in cultural heritage artefacts. Choosing between analytical techniques for polymer characterisation can be based upon the need to detect change in properties of plastics during service life of plastics in cultural heritage artefacts.

technique	identification of polymer	characterisation of polymer	additives (< 3%)	fillers (> 3%)	additives (> 3%)	plasticisers (> 3%)	invasive	sample size	non-invasive (fibre optics)	portable/transportable	expertise required	cost
FTIR	•	•		•	•	•	•	0.1-1 mm ³	•	•	# / ##	€€
Raman	•	•		•	•	•	•	0.1-1 mm ³	•	•	# / ##	€€€
Py-GCMS	•	•*	•		•	•	•	0.1 mm ³			##	€€€
EGA	•				•	•	•	0.5 mm ³			##	€€€
NIR	•	•*			•*	•*			•	•	#	€/€€
UV-Vis		•							•	•	#	€
DSC		•					•	5 mm ³			#	€/€€
SEC		•					•	0.1 mm ³			##	€€€
SPME-GCMS		•			•	•	•	0.1 mm ³			##	€€€
TGA		•		•		•	•	1 mg			##	€€
DMA		•					•	5 x 20 mm			##	€€€
TA		•					•	5 x 100 mm			#	€€€
Heat of Combustion	•						•	30 mg			##	€
CL		•					•	0.5 mg			##	€€
FTIR-imaging	•	•		•	•	•	•	0.01 mm ³			##	€€€
NIR-imaging	•	•		•	•	•			•	•	##	€€€
THz-imaging		•							•		##	€€€

* = possible for specialized applications, # = low, ## = very high, € = low (< 30 k€), €€ = medium (> 30 k€ < 100 k€), €€€ = high (> 100 k€)

Figure 58. Table for polymer identification and characterisation

