

# Low-Variance ATR-FTIR Assessment of Degree of Conversion in 3D-Printed Dental Resins

Comparison of ATR-FTIR protocols for Bis-EMA and UDMA-based microfilled resins degree of conversion analysis.

## Ester-Associated Protocol

The 1320/1352  $\text{cm}^{-1}$  ester-associated band pair offers chemically plausible, low-variance, statistically stable conversion data during curing.

## Conventional Aromatic Protocol

The 1637/1608  $\text{cm}^{-1}$  aromatic-normalised approach shows formulation-dependent instability and spectral congestion in some resins.

## Practical Implications

Ester-associated ATR-FTIR workflow enables robust characterisation and reliable comparison of curing states in dental additive manufacturing.

