Acid functionalized hybrid polymers on ORMOCER® basis

**Functionality**
- Carbonic-, phosphonic-, phosphoric- and/or sulfonic acid-based resins
- Additional functional groups possible

**Structure**

![Chemical structure](image)

**Chemical / physical properties**
- pH-value up to 0.1
- High etching effect on tooth structure
- Chemical / physical adhesion to inorganic substrates (e.g., tooth structure)
- Hydrolytically stable adhesive systems possible
- Good solubility in water or in water-miscible solvents such as acetone and ethanol
- Photochemically resp. thermally polymerizable

**Applications**
(Self)etching dental adhesives

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Application-specific characterizations

Direct application → Exposure → Curing by light → Composite → Curing by light

- embedded bovine tooth → Rinsing off → 3D laser scanning microscopy (determination of etching depth)
- REM
- Etching effect on enamel → Determination of etching depth and average roughness
- Interfacial characterization: REM, AFM, μ-Raman, ...

Adhesion examination testing

Shear bond strength test, micro tensile test, and compression shear test

Other fields of application

- Adhesion promoter
- Ion exchanger
- Proton conductor

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