ANIMON

**advantages**
- high mechanical, thermal and chemical stability
- variable geometrical forms
- transport pores with axial orientation
- hierarchical pore structure
- good flow profile and low pressure loss
- high surface area suitable for coatings

**challenges**
- functional pores with preferable orientation
- controlled synthesis of functional pores between 1 nm and 1 µm and transport pores between 200 nm and 1 mm
- pseudomorphic transformation into other porous silicates
- so far, only small monoliths can be produced (Ø ≤ 1 mm, l ≤ 20 cm)

**idea & motivation**
Development of technologies for redrawing & joining
Development of technologies for production of pore systems
Development of technologies for functionalization of glass surfaces for biological and sensorical applications
Development of optical-chemical sensors for measurement of O₂, CO₂, and pH
Development of marking systems for curved and movable surfaces
Development of technologies for laser-assisted thin coatings
Development of technologies for glass melting & preforms

**first results**

**solution**

**bundle stacking**

**different shapes of monoliths** [1]

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**advantages**
- synthesis of MONOLITHS with high chemical and mechanical STABILITY, low pressure loss and improved flow profile
- production of high surface areas for coatings
- modifications of the glass surfaces
- manufacturing of GLASS-TUBE-BUNDLES to produce innovative glass monoliths

**concept**: HIERARCHICAL PORE STRUCTURE similar to a TOPOLOGY LIKE A LUNG

**transport pores**: adjustment by the arrangement and selection of the preform tubes and rods

**functional pores**: adjustment by the glass composition, parameters of the heat treatment and extraction

**development of Na₂O·8·SiO₂·SO₃ glass taking account to the functional pores**

**cheap manufacturing of MICROCAPILLARY COMPONENTS by drawing technology**

**development of pH-, CO₂-, and O₂- SENSORS**

**cheap manufacturing of MICROCAPILLARY COMPONENTS by drawing technology**

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A maximum length of 1.2 m and a minimum pipe diameter of 25 µm could be achieved. First experiments with rod-shaped preforms resulted in gussets with final minimal diameters of 5 to 10 µm. After the extraction process the preforms shows a segregation. A minimal pore diameter of 44 nm, a surface area of 67 m²/g and a pore volume of 0.65 cm³/g can be established. To obtain smaller pores another glass must be developed. A possible glass may be 70_23_7 with a drawing temperature between 725 - 750 °C. The temperature range is close to the remixing temperature.

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