The formation of nanostructured CaTiO$_3$ by the hydrothermal treatment of a Na–Ti-based one-dimensionally nanostructured precursor

**Aim**

The hydrothermal synthesis of one-dimensionally nanostructured CaTiO$_3$.

**Experimental**

- Hydrothermal synthesis of 1D Na–Ti-based precursor:
  TiO$_2$ (Anatase) and 10M NaOH
  165°C/72h

- Hydrothermal intercalation of Ca$^{2+}$
  Na-Ti-based precursor and excess of Ca(OH)$_2$
  100°C/12h, 200°C/24h

**Results**

The hydrothermally synthesized Na–Ti-based precursor
165°C/72h

The hydrothermal incorporation of Ca$^{2+}$ in the structure of Na–Ti-based precursor
100°C/12h

**Summary**

- the hydrothermal treatment of Na-Ti-based nanotube precursor at 100°C is suitable for the preparation of Ca-Ti-based nanotubes and
- leads to the formation of CaTiO$_3$ single crystal, well crystallized nanocrystals at 200°C
- Na – Ti-based 1D nanostructures exhibit photocatalytic activity in UV spectra

**Potential Applications**

- Na-Ti-based nanotubes: ion-exchange processes, photocatalytic reactions in UV and visible spectrum, fuel-cell electrolytes, gas sensors, ...
- use of platelike CaTiO$_3$ particles as a template in the templated grain growth method