

**Heat capacity determination of elastomers used for hydrogen fuel cells**

**INTRODUCTION**

During the development of a hydrogen fuel cell, every part of the fuel cell requires careful consideration. Incorrect fuel gaskets can lead to gas leaks and reduction of the fuel cell performance. Elastomers show an important variation of their heat capacity near the glass transition. The knowledge of the temperature of glass transition and the heat capacity before and after the glass transition is of a great utility for their uses inside hydrogen fuel cell.

**EXPERIMENT**

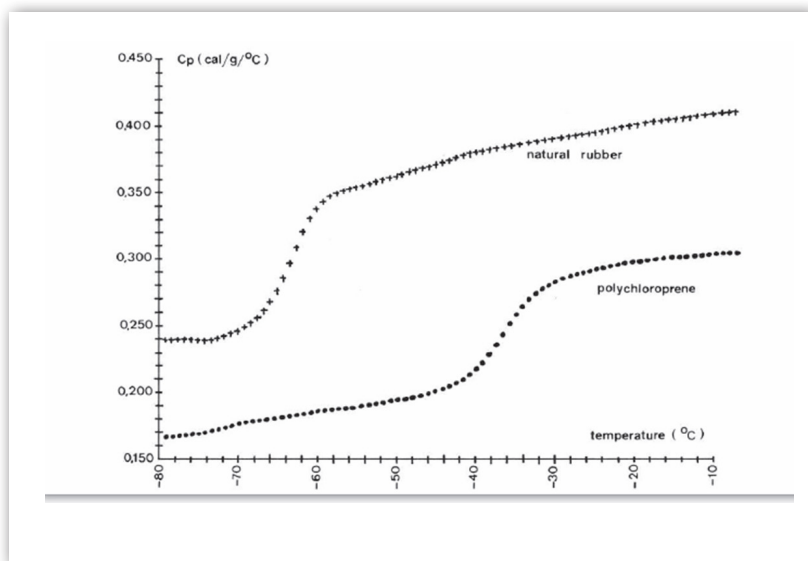
- Samples: natural rubber (156.7 mg)  
polychloroprene (230.8 mg)
- Crucible: Aluminum
- Heating mode: Scanning 5°C/min
- Use of the sub ambient cooling accessory

**RESULTS AND CONCLUSION**

The mean values of specific heat before and after the glass transition are the following (in cal.g-1.°C-1) :

	Before Tg	After Tg
Natural rubber	0.240	0.360
Polychloroprene	0.190	0.300

The variation of heat capacity due to glass transition is 0.12 cal.g-1.°C-1 for natural rubber and 0.11 cal.g-1.°C-1 for polychloroprene.



**INSTRUMENT**

**CALVET PRO DSC**

**-120 to 830°C**



**HIGHEST HEAT MEASUREMENT ACCURACY**  
3D sensor based on thermocouples with Joule effect calibration.

**EXTERNAL COUPLING CAPABILITY**

**CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS**  
to perform even the most demanding experiments using one instrument :

- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment