

## Technical Data Sheet Sulfonated poly(ether ether ketone) (SPEEK)

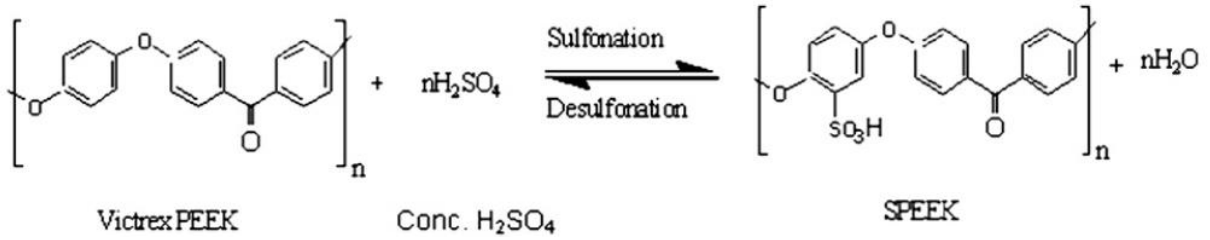
### Properties

**Form :** Solid

**Shape :** precipitated polymers

**Particle:** Amorph, crystalline polymer

**Solvent :** Dimethyl acetamide (DMAc)



Schematic representation of PEEK sulfonation



Precipitated SPEEK polymers

### Product Description

SPEEK is a proton-conductive polymer and can be synthesized using commercial PEEK (Vitrex 450PF). At SUNUM, we produce SPEEK with customized sulfonation degrees, enabling control over its proton conductivity and ion exchange capacity. Production is carried out in a standardized manner based on the specified sulfonation level. Nevertheless, slight variations in the degree of sulfonation (DS) may occur between batches.

**Application areas:** Fuel cells, Flow Batteries, Hydrogen Storage and composite materials production.

**Storage conditions:** No rules.

**Packaging :** gr, plastic bottle

## Quality Control

IEC, DS, Fenton test and  $\sigma^d$  characterization of membranes

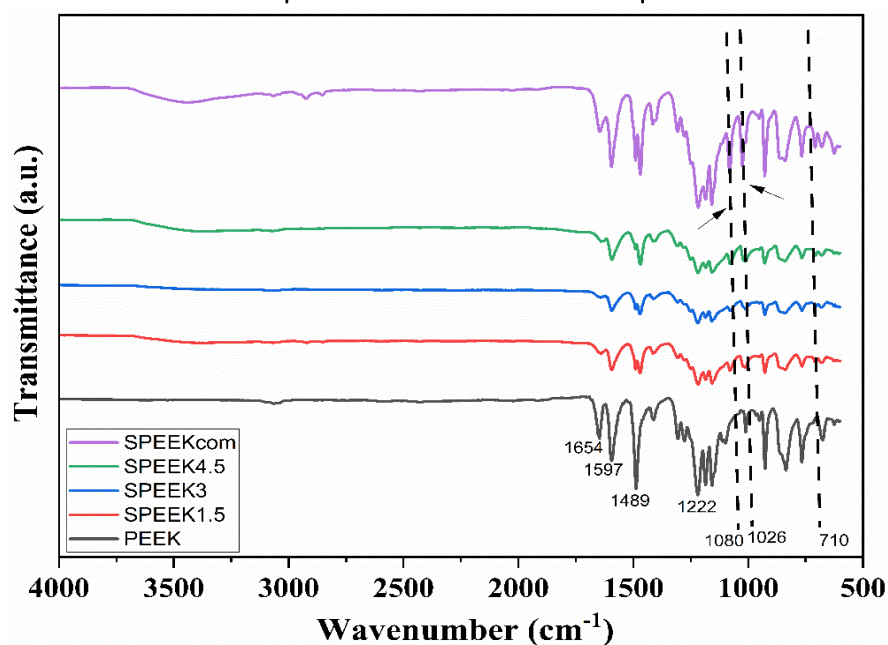
Membrane	Thickness (mm)	IEC <sub>m</sub> <sup>a</sup> (meq g <sup>-1</sup> )	DS
SPEEK1.5	0.080	1.39	47
SPEEK3	0.023	1.48	50
SPEEK4.5	0.067	1.64	57
Nafion 115 <sup>†1</sup>	0.123	0.89	52

<sup>a</sup>IEC; Ion exchange capacity of the films

<sup>b</sup>WL: Decomposition time from Fenton test, at 68°C, h

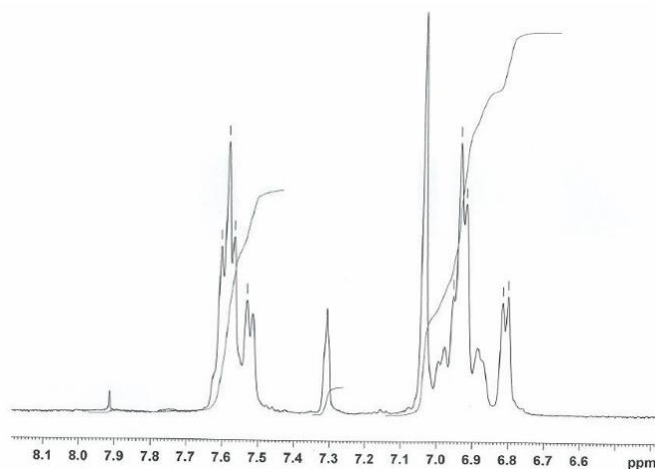
<sup>c</sup>Proton conductivity at 23 °C, %100 RH, mS cm<sup>-1</sup>

FTIR spectra of PEEK and SPEEK samples



NMR spectra SPEEK samples

DS= %50



<sup>1</sup> Li, Wen, Manthiram Arumugam, Guiver Michael D. , Liu Baijun, High performance direct methanol fuel cells based on acid–base blend membranes containing benzotriazole, *Electrochemistry Communications* 12 (2010) 607–610.  
doi:10.1016/j.elecom.2010.02.011.

TGA of PEEK and SPEEK samples

