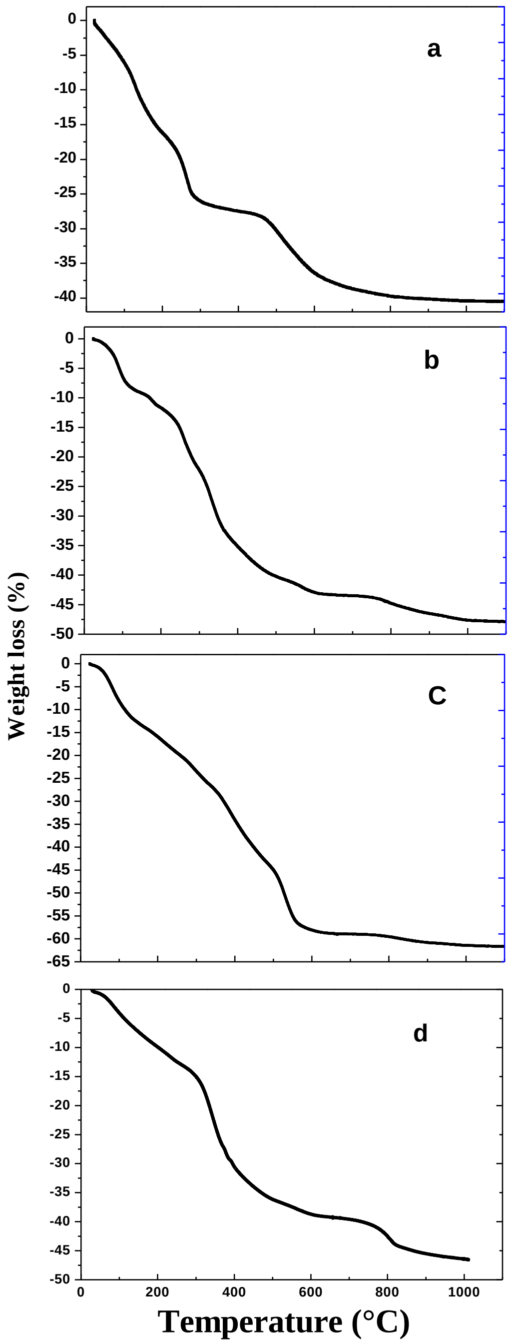
Supporting Information:

SEI-1: TG curves for a) ZnAl/Cl, b) Zn_2Al/AMPS, c) Zn_2Al/AMPS(200) and d) $Zn_2Al/AMPS_T$. Heating slope of 5°C/min.



Chemical analyses:

Theoretical values:

	Zn_2Al/AMPS	Co_2Al/AMPS	$Co_2Fe_{0.5}Al_{0.5}$/AMPS
Co	-	22.7	22.5
Fe	-	-	5.3
Al	5.2	5.2	2.6
Zn	25.0	-	-
O	n.d.	n.d.	n.d.
H	n.d.	n.d.	n.d.
C	n.d.	n.d.	n.d.
N	2.7	2.7	2.7
S	6.1	6.2	6.1

n.d.: not determined

Note that O, C and H were not determined; the amount of AMPS was calculated from S elemental analyses.

$Zn_{0.66}Al_{0.33}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{\approx 0.33}.nH_2O$

[Zn-Al-AMPS]: $Zn_{0.66}Al_{0.33}(OH)_2\,(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.26}(CO_3)_{0.04}.nH_2O$

[Zn-Al-(AMPS)$_{200°C}$]: $Zn_{0.66}Al_{0.33}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.30}(CO_3)_{0.02}.n\ H_2O$

[Zn-Al-AMPS]$_{250°C}$: $Zn_{0.66}Al_{0.33}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.25}(CO_3)_{0.04}.n\ H_2O$

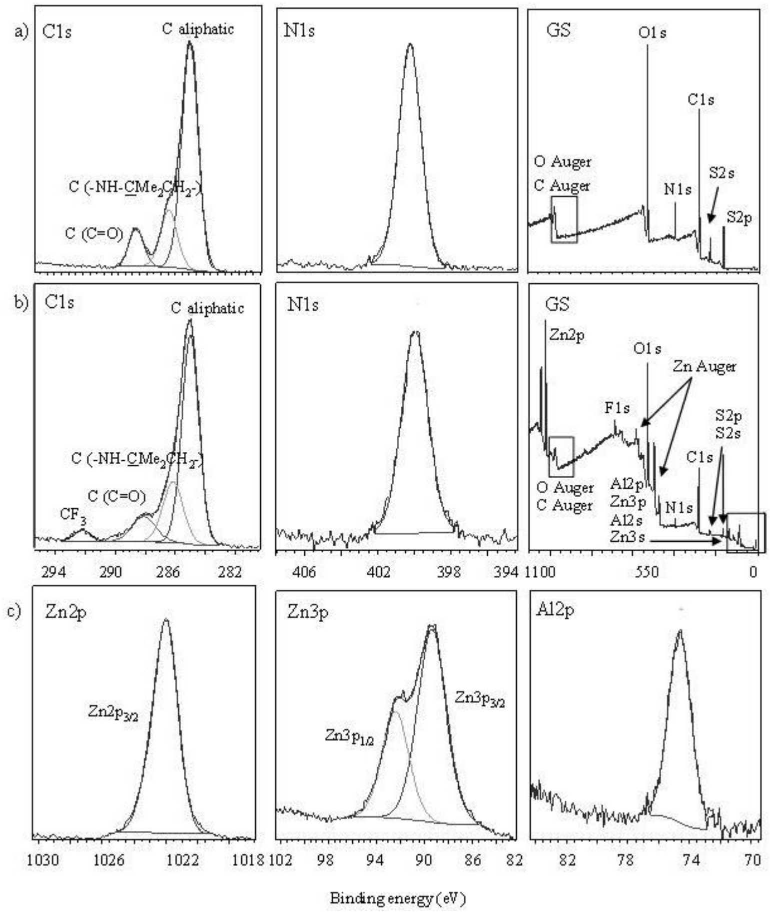
[Zn-Al-(AMPS)$_{200sol}$] : $Zn_{0.66}Al_{0.33}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.33}.n\ H_2O$

$Co_{0.66}Al_{0.33}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.32}(CO_3)_{0.01}.nH_2O$

$Co_{0.66}Fe_{0.15}Al_{0.15}(OH)_2(H_2C{=}CH\text{-}CO\text{-}NH\text{-}C(CH_3)_2\text{-}CH_2\text{-}SO_3H)_{0.30}(CO_3)_{0.02}.nH_2O$

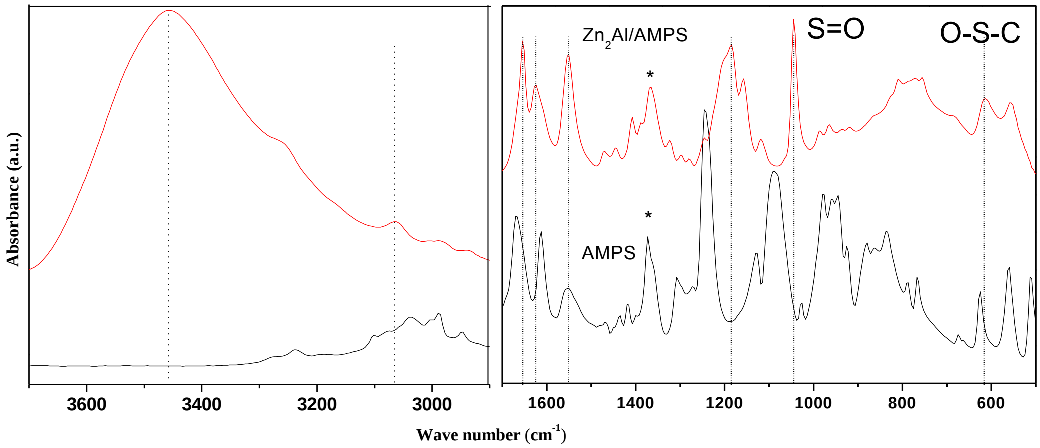
Supplementary Material (ESI) for Journal of Materials Chemistry

<u>SEI-2</u>: Zn2p, Zn3p, Al2p XPS analyses for AMPS and H(AMPS). The binding energy positions and associated peak width (FMWHM) are summarized in a table.

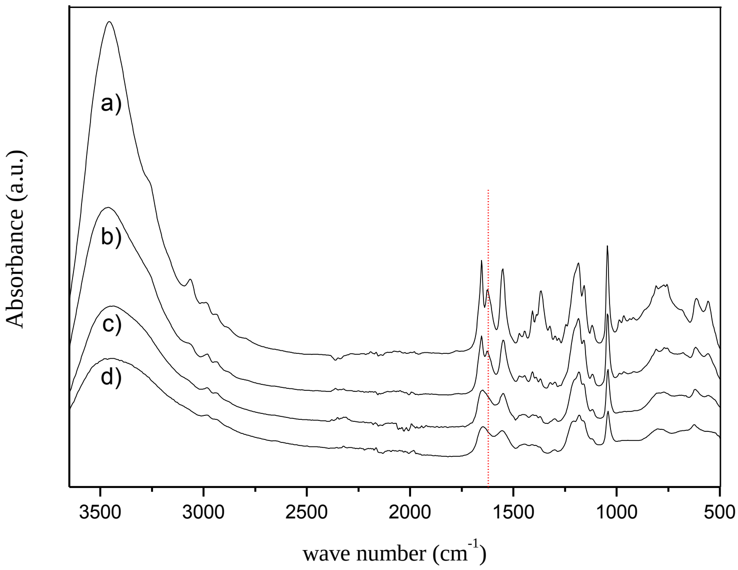


compound ***BE region***	**AMPS**		**Zn_2Al-AMPS**	
O1s	531.5 (1.4) 533.1 (1.7)		531.9 (1.8)	
N1s	400.2 (1.5)		400.1 (1.7)	
C1s	285.0 (1.3) 286.4 (1.3) 288.6 (1.2)		285.0 (1.3) 286.2 (1.6) 288.3 (1.8) 292.2 (1.3)	
$S2p_{3/2-1/2}$	168.0 (1.2) 169.2 (1.3)		168.4 (0.9) 169.6 (0.9)	
$Zn3p_{3/2-1/2}$			89.4 (2.8) 92.4 (2.6)	
Al2p			74.6 (1.7)	

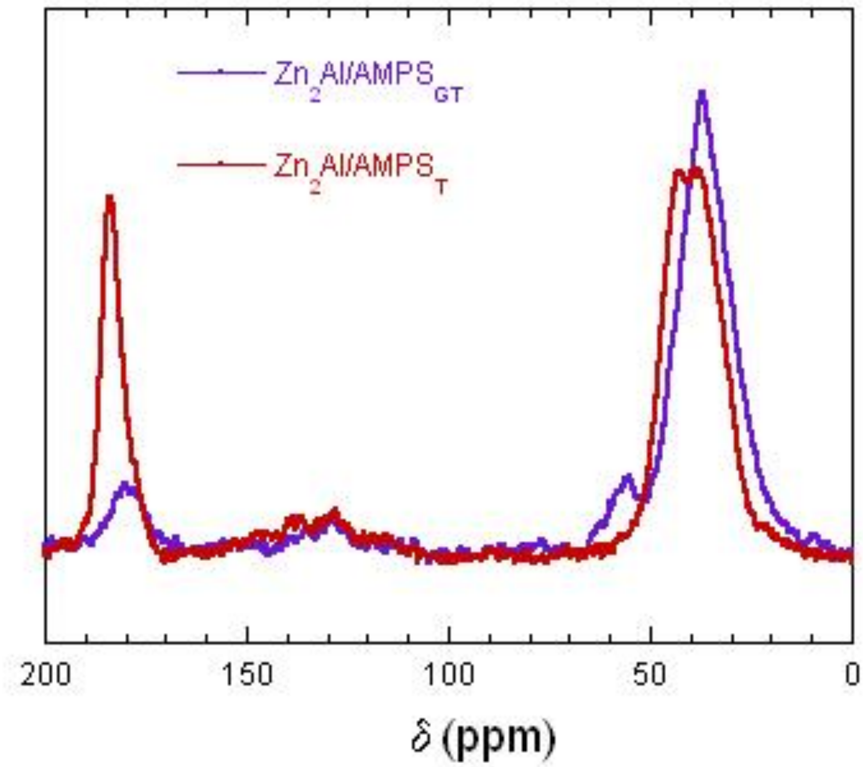
SEI-3: FTIR spectrum of AMPS and Zn_2Al/AMPS.



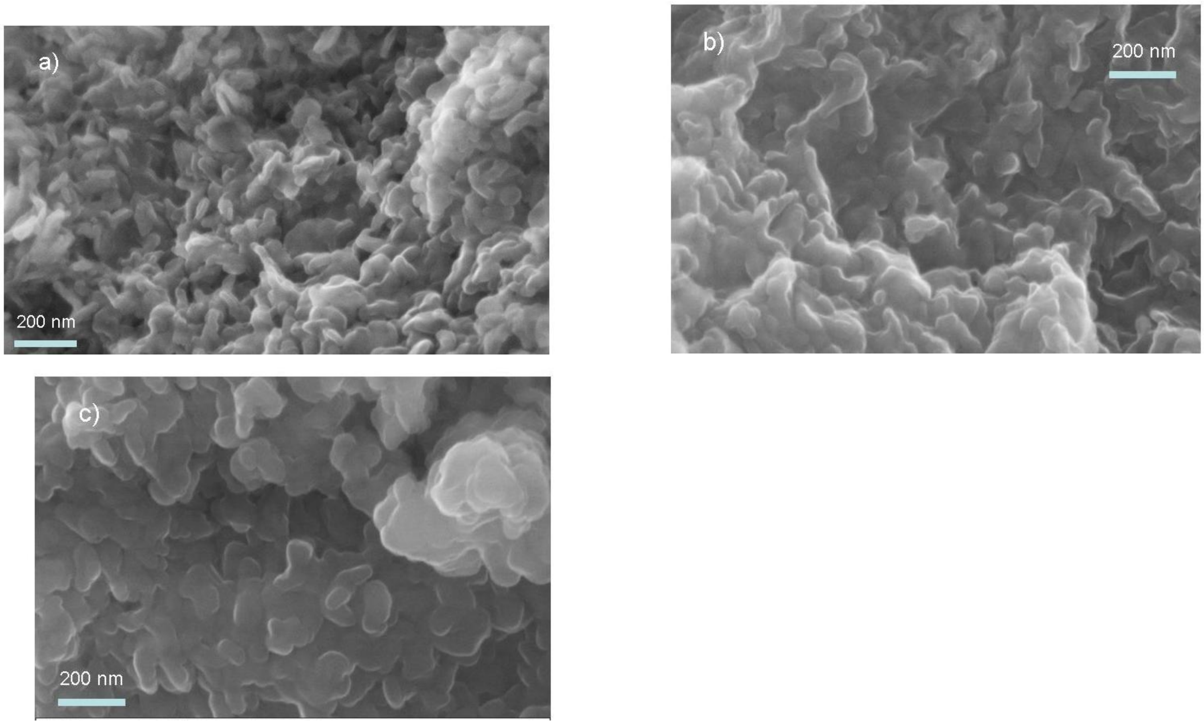
SEI-4: FTIR spectrum of Zn_2Al/AMPS(T) at a) 25°C, b) 200°C, c) 225°C and d) 250°C. C=C vibration band is located by the dashed line.



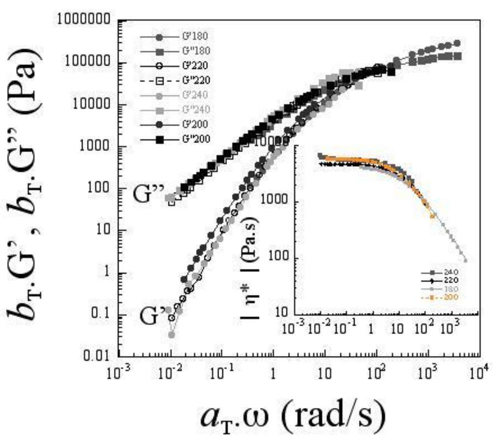
SEI-5: ^{13}C CPMAS NMR of $Zn_2Al/AMPS_{GT}$ and $Zn_2Al/AMPS_T$.

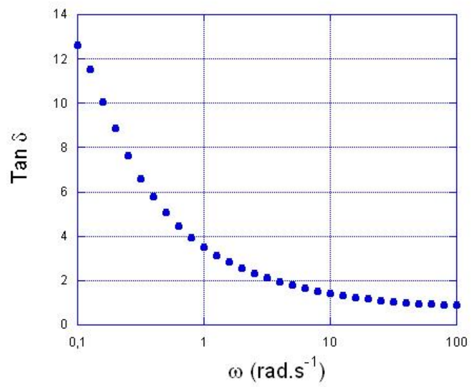


SEI-6: SEM of a) $Zn_2Al/AMPS(250)$ b) $Zn_2Al/AMPS_{GT}$ and c) $Zn_2Al/AMPS_T$

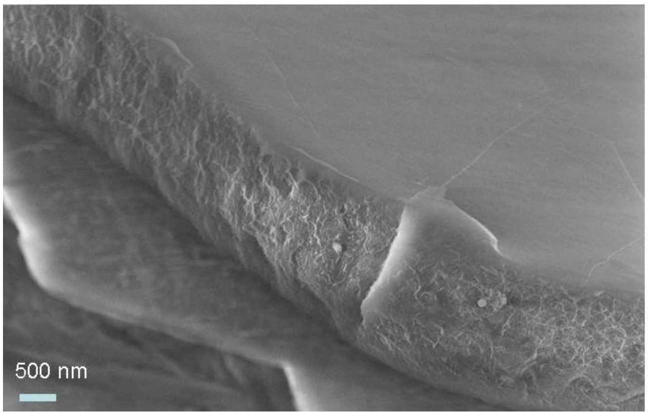


SEI-7: Master curves for PS expressed as elastic modulus G' and loss modulus G" (left part). In inset the complex viscosity is shown. On the right part tan δ variation (at 180°C) against ω.

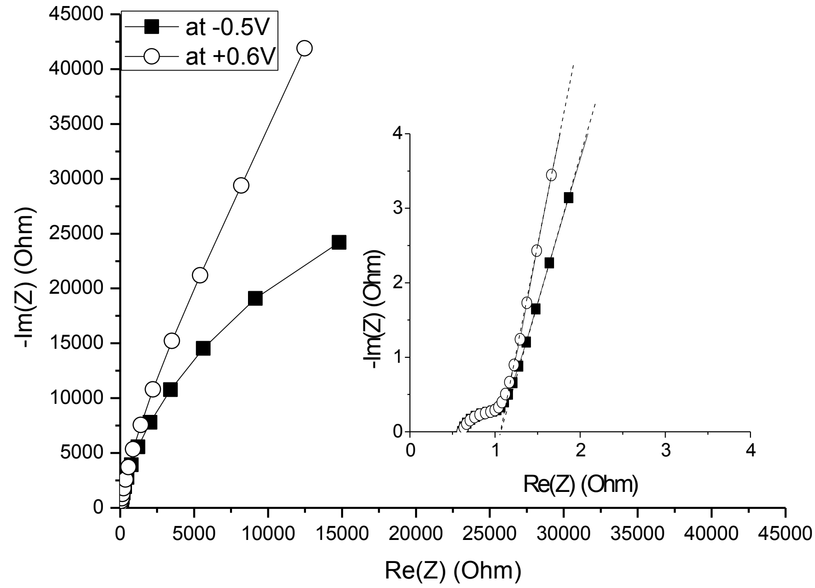




SEI-8: SEM picture of slice of PS:Zn_2Al/AMPS. The loading is of 15 wt. %.



<u>SEI-9</u>: EIS spectrum of Co_2Al/AMPS



<u>SEI-10</u>: Typical impedance plots Z' *vs* jZ" obtained for PS and PS:Zn_2Al/AMPS composite.