Electronic Supplementary Material (ESI) for RSC Advances.


# Self-healing of abrasion damage on epoxy resin controlled by ionic liquid

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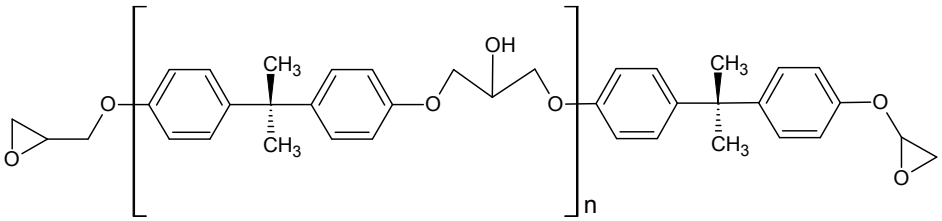
**Table S1. Hardness values (standard deviations)**

| Hardness | ER | ER+7%IL | ER+8%IL | ER+9%IL | ER+12%IL |
|---|---|---|---|---|---|
| **Shore D** | 82.8 (0.23) | 76.5 (0.65) | 77.2 (0.46) | 71.8 (0.78) | 75.8 (0.37) |
| **HV** | 18.9 (1.32) | 15.6 (0.56) | 14.2 (0.38) | 15.12 (0.65) | 10.88 (0.81) |

**Table S2. Dynamic mechanical properties**

| Material | T (ºC) | E' (MPa) (onset) | T (ºC) | E'' (MPa) (maximum) | T (ºC) | tan δ (E''/E') (maximum) |
|---|---|---|---|---|---|---|
| **ER** | 60.45 | 940.6 | 62.46 | 289.6 | 70.89 | 1.16 |
| **ER +7%IL** | 44.47 | 767.2 | 33.92 | 240.1 | 57.97 | 0.90 |
| **ER +9%IL** | 48.61 | 820.3 | 49.44 | 253.8 | 62.21 | 1.04 |
| **ER+12%IL** | 41.11 | 767.8 | 35.38 | 262.6 | 54.84 | 0.95 |

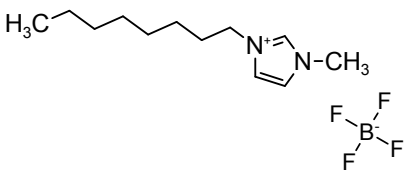
**a)**



**DGEBA**

**b)**

+



**1-octyl-3-methylimidazolium IL**

**c)**

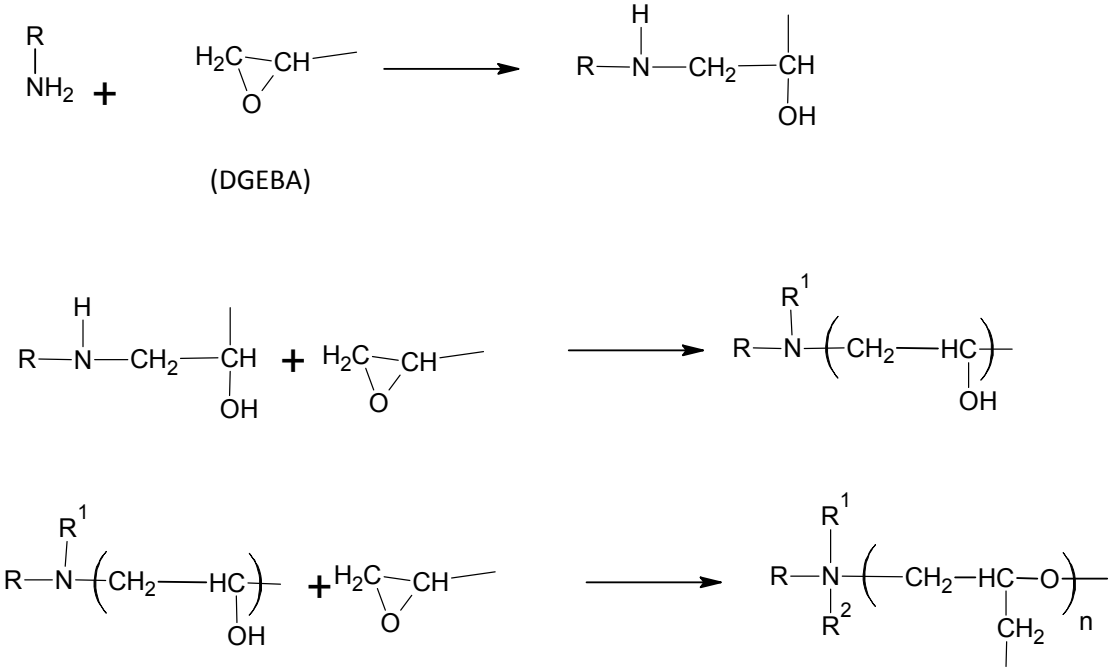



**Figure S1. a) Prepolymer; b) Ionic liquid; c) Scheme of the resin formation process by amine hardener.**

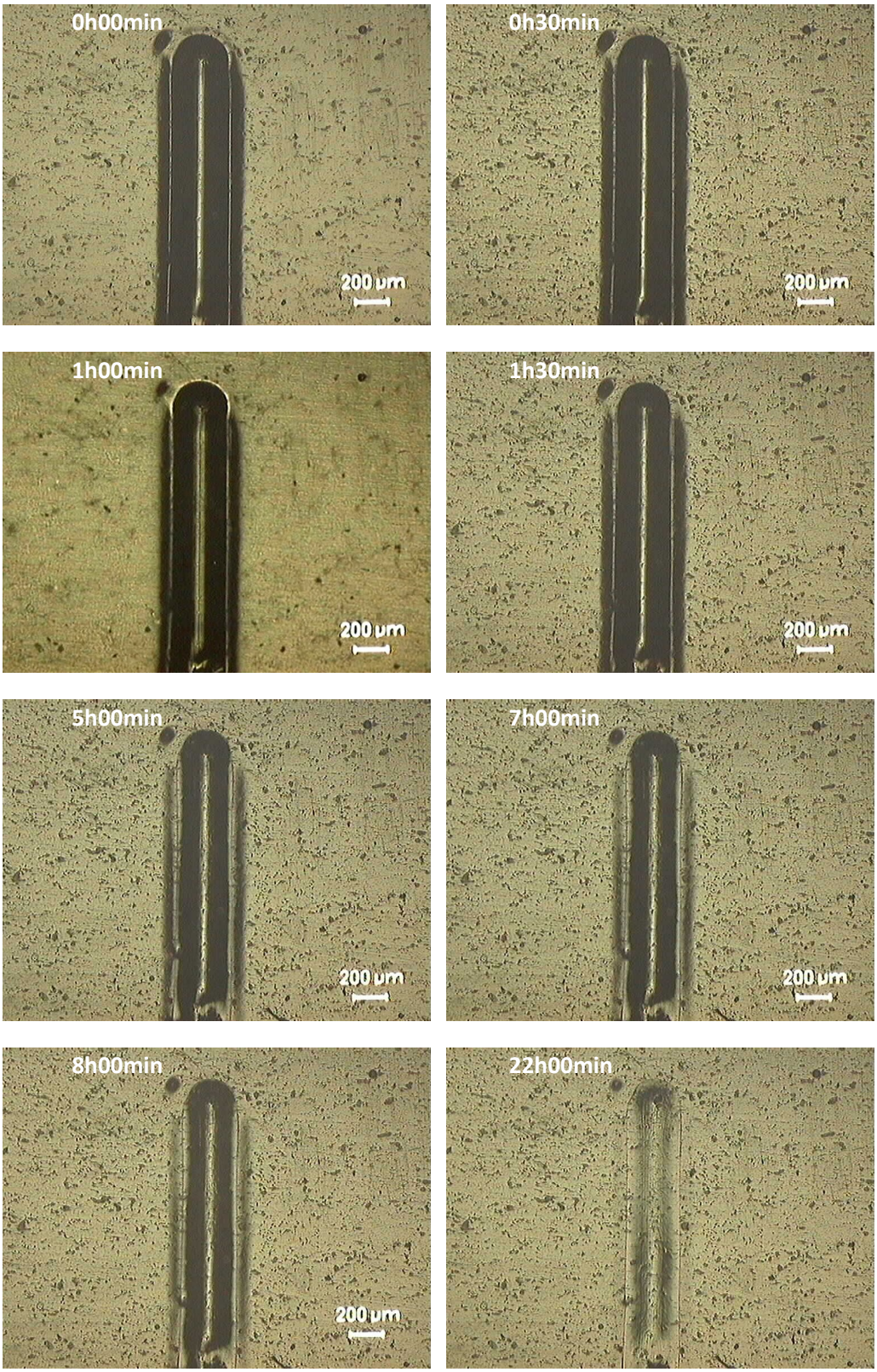



**Figure S2. Time sequence of optical micrographs of the scratching wear track on ER+7%IL.**

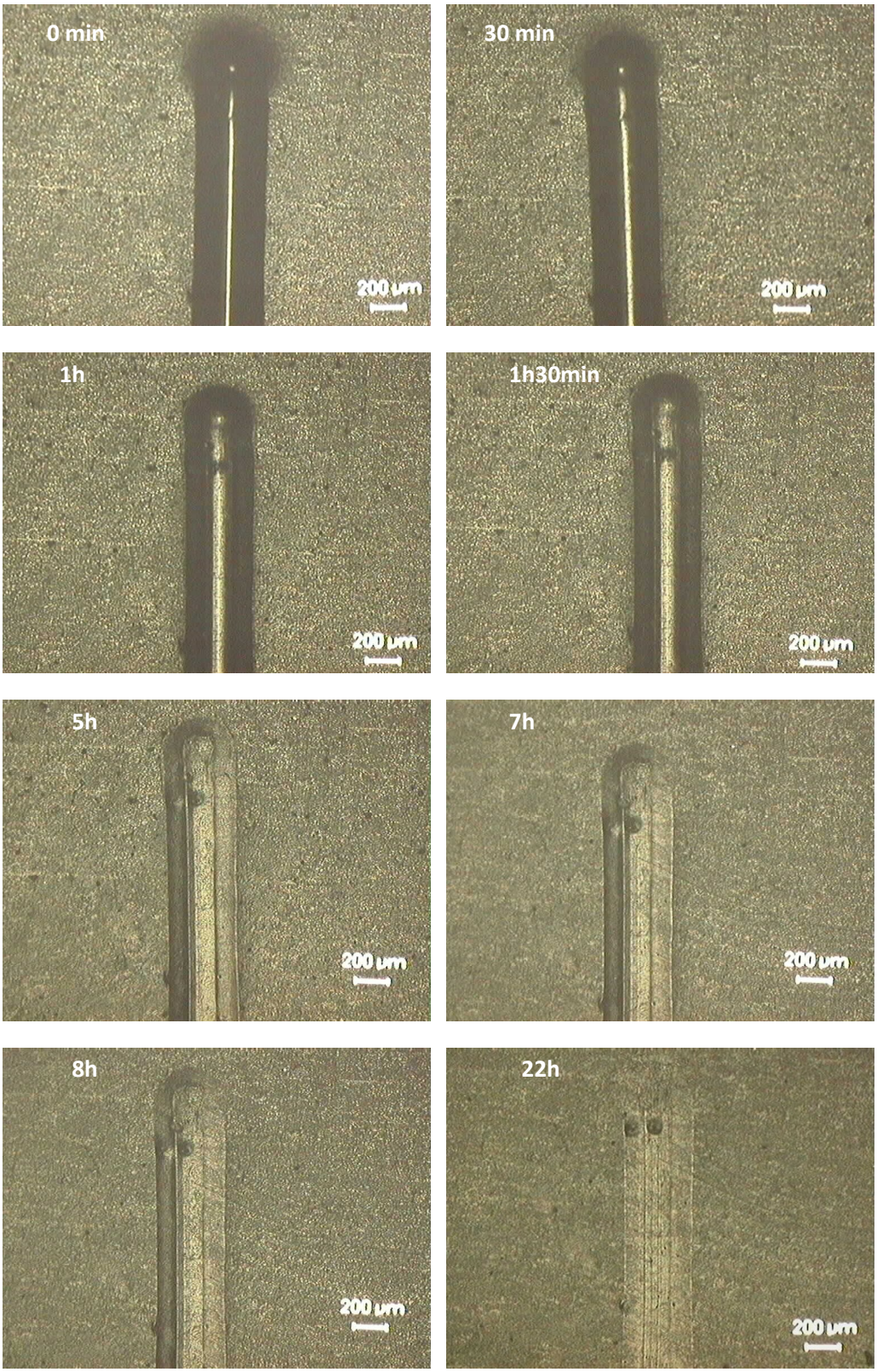



**Figure S3. Time sequence of optical micrographs of the scratching wear track on ER+9%IL.**

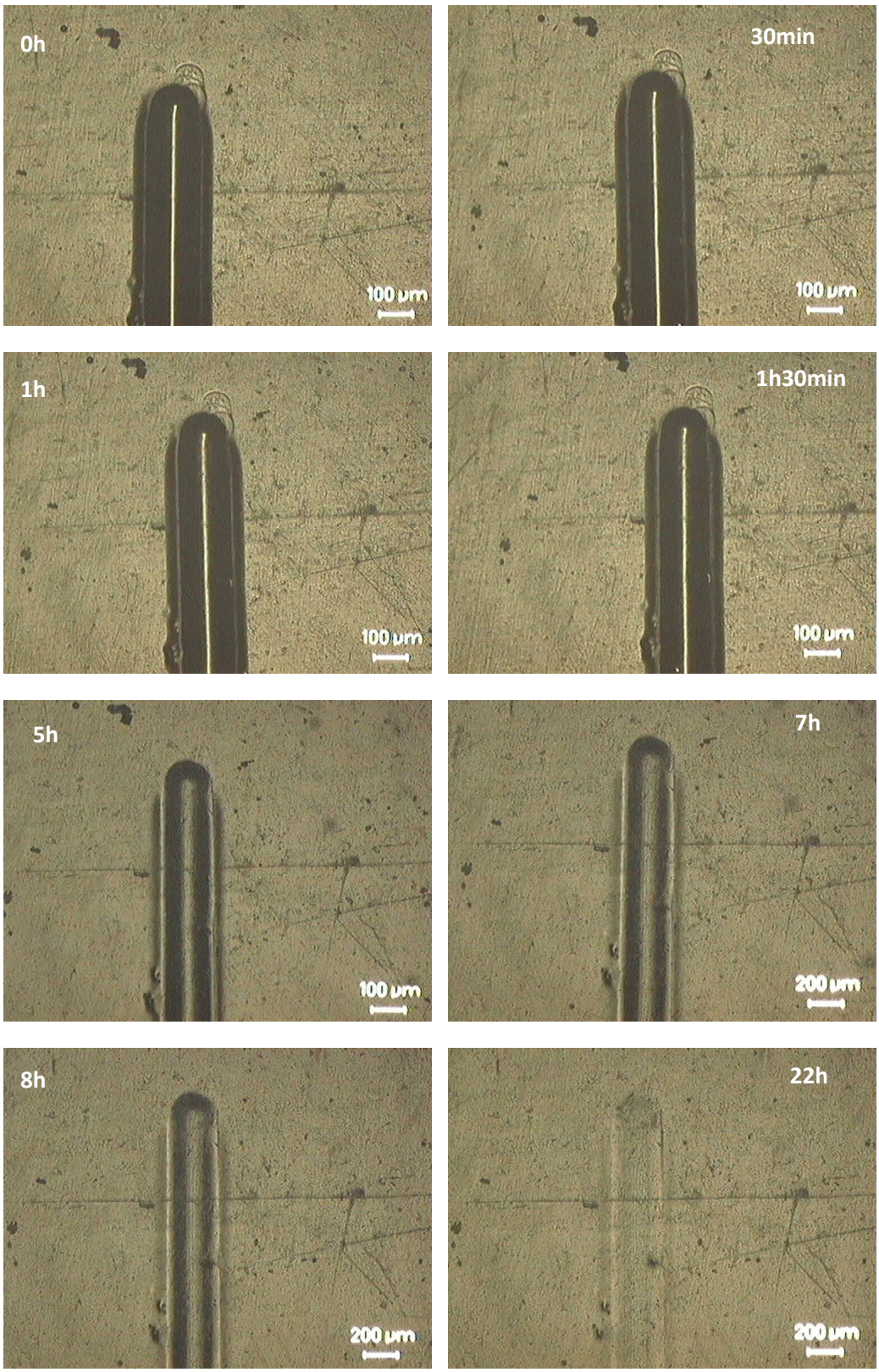



**Figure S4. Time sequence of optical micrographs of the scratching wear track on ER+12%IL.**

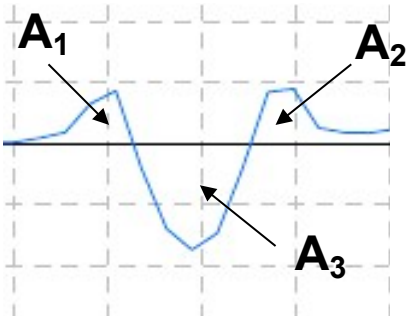



**Figure S5. Cross section areas of the wear tracks.**

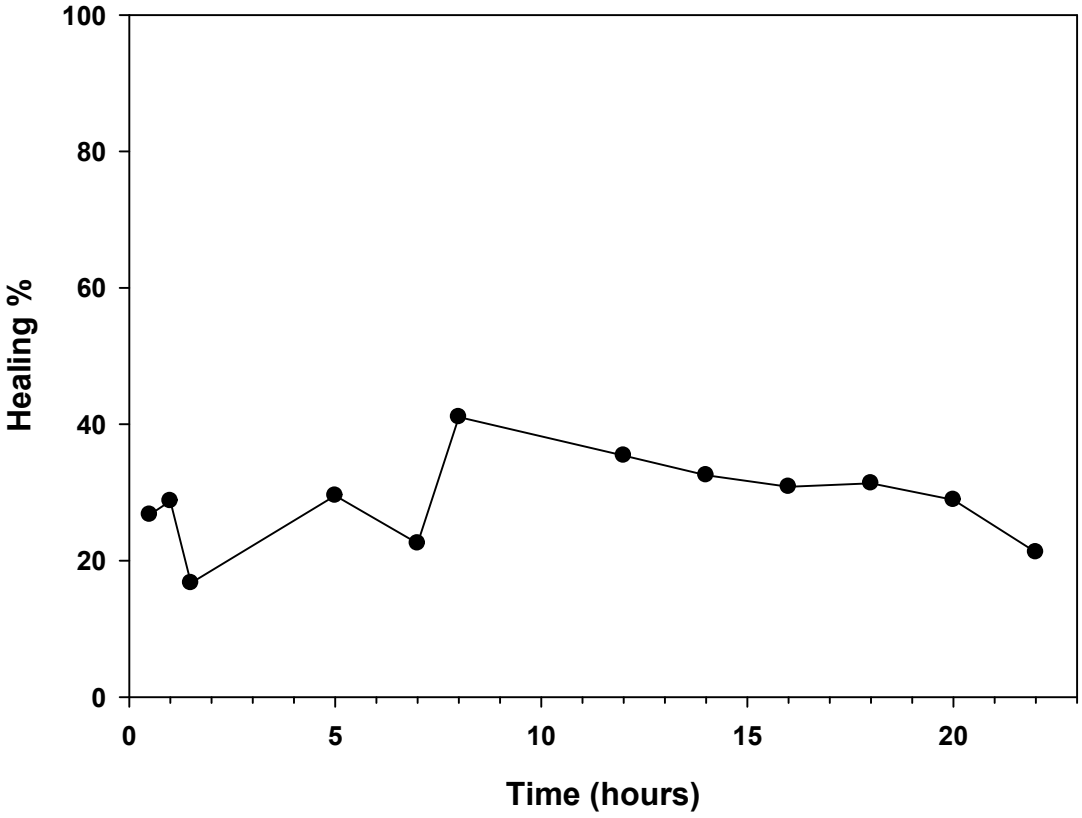



**Figure S6. Healing percentages (as reduction of cross section areas) as a function of time for neat epoxy (ER).**

**a)**


**b)**

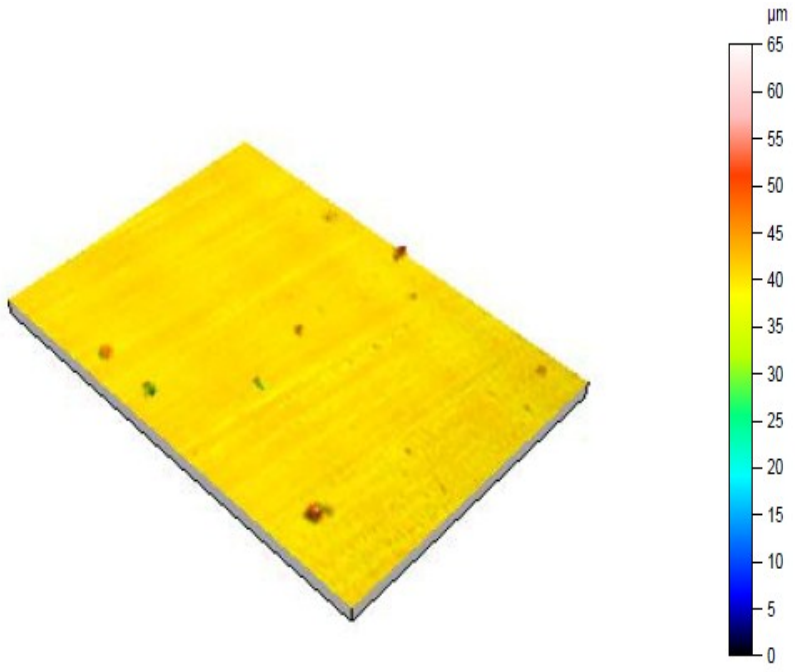



**Figure S7. Surface topography of cross section showing porosity: a) ER+9wt.%IL; b) ER+12wt.%IL.**