

- [ICP Multiparametric Microscopy Facility](#) (Subdivision: OCR station)
- Report Ser. 1-18: Digitalization of Microscopic Images of Polymers and Composite Materials from the Central Research Institute of Polymers and Artificial Leathers (SEM, TEM, optical plastolgraphy / polymerography)

OCR Report Index: 181906-2

Object(s): Polyethylene terephthalate fibers

## Introduction: Basic properties

| Polyethylene terephthalate            |             |
|---------------------------------------|-------------|
| Names                                 |             |
| IUPAC name                            |             |
| Poly(ethyl benzene-1,4-dicarboxylate) |             |
| Identifiers                           |             |
| CAS Number                            | 25038-59-9  |
| Abbreviations                         | PET, PETE   |
| ChemSpider                            | none        |
| ECHA InfoCard                         | 100.121.858 |

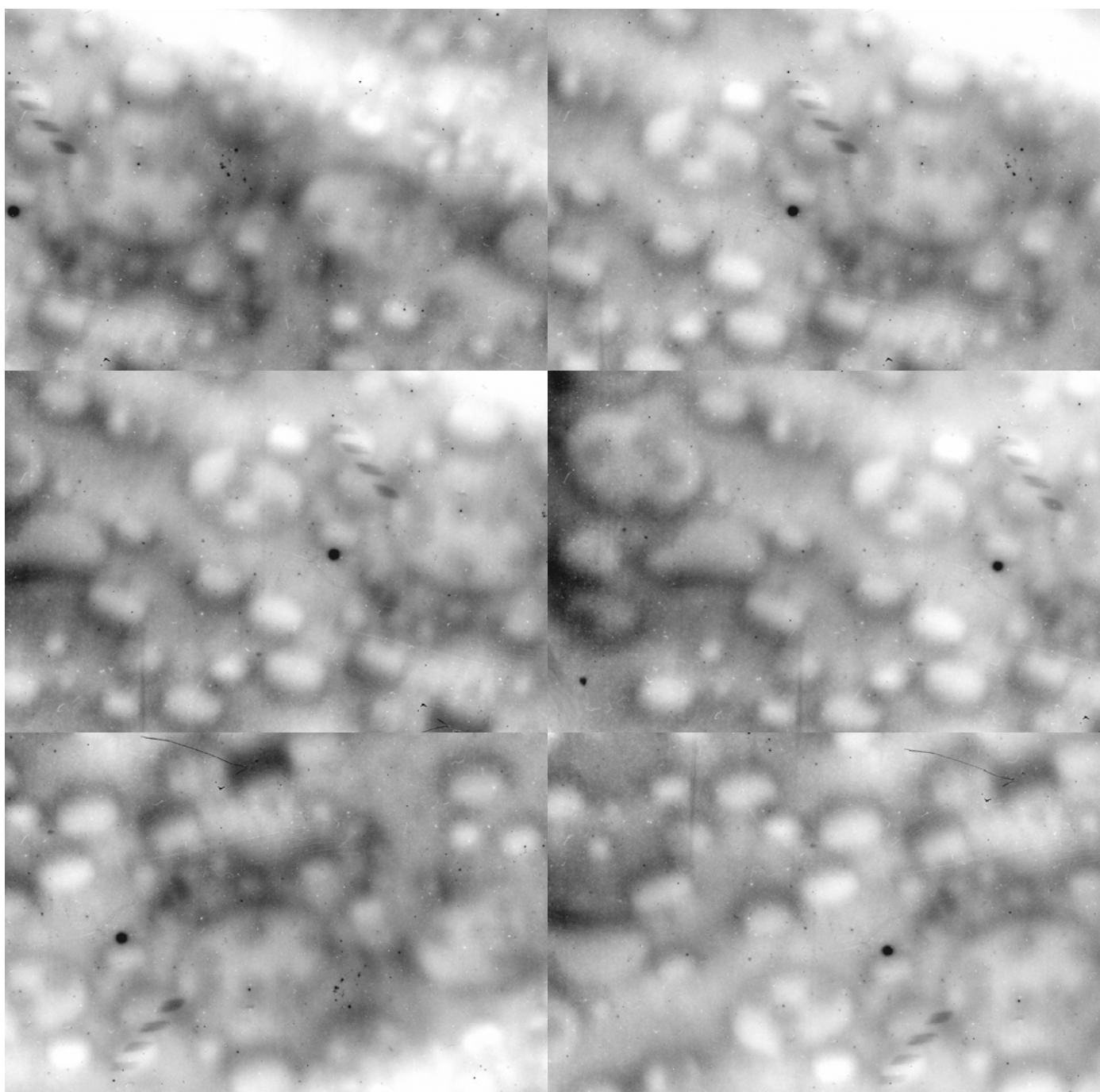
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| Properties                               |                                                                                                                    |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Chemical formula                         | $(C_{10}H_8O_4)_n$                                                                                                 |
| Molar mass                               | variable                                                                                                           |
| Density                                  | 1.38 g/cm <sup>3</sup> (20 °C),<br>amorphous: 1.370 g/cm <sup>3</sup> ,<br>single crystal: 1.455 g/cm <sup>3</sup> |
| Melting point                            | > 250 °C (482 °F; 523 K)<br>260 °C                                                                                 |
| Boiling point                            | > 350 °C (662 °F; 623 K)<br>(decomposes)                                                                           |
| Solubility in water                      | practically insoluble                                                                                              |
| log <i>P</i>                             | 0.94540                                                                                                            |
| Thermal conductivity                     | 0.15 to 0.24 W m <sup>-1</sup> K <sup>-1</sup>                                                                     |
| Refractive index( <i>n<sub>D</sub></i> ) | 1.57–1.58, 1.5750                                                                                                  |
| Thermochemistry                          |                                                                                                                    |
| Heat capacity ( <i>C</i> )               | 1.0 kJ/(kg·K)                                                                                                      |

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## Bubble-like structures (positive contrast)

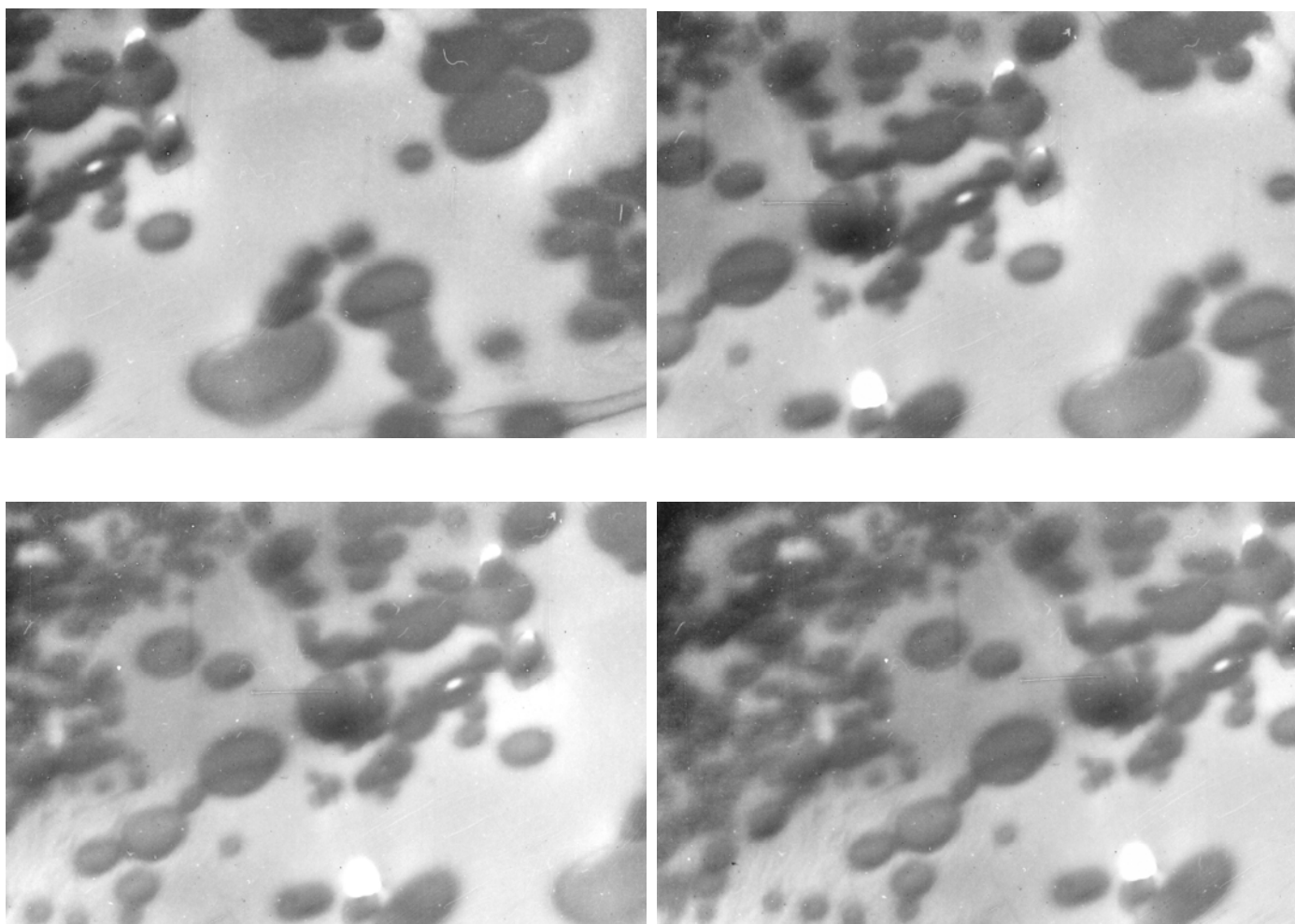
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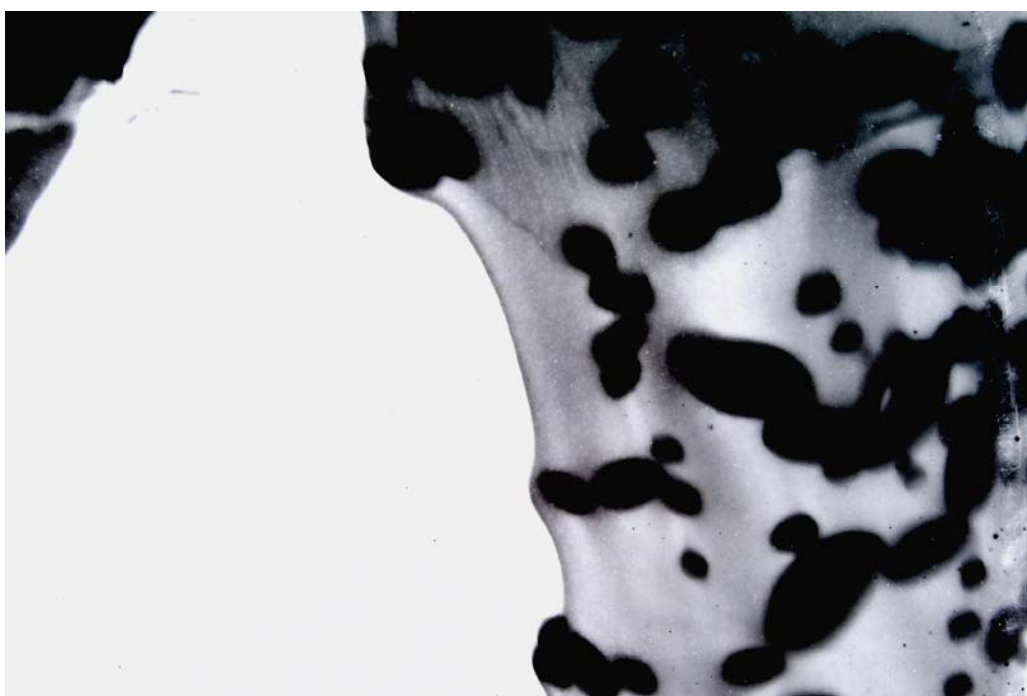
## Bubble-like structures (negative contrast)

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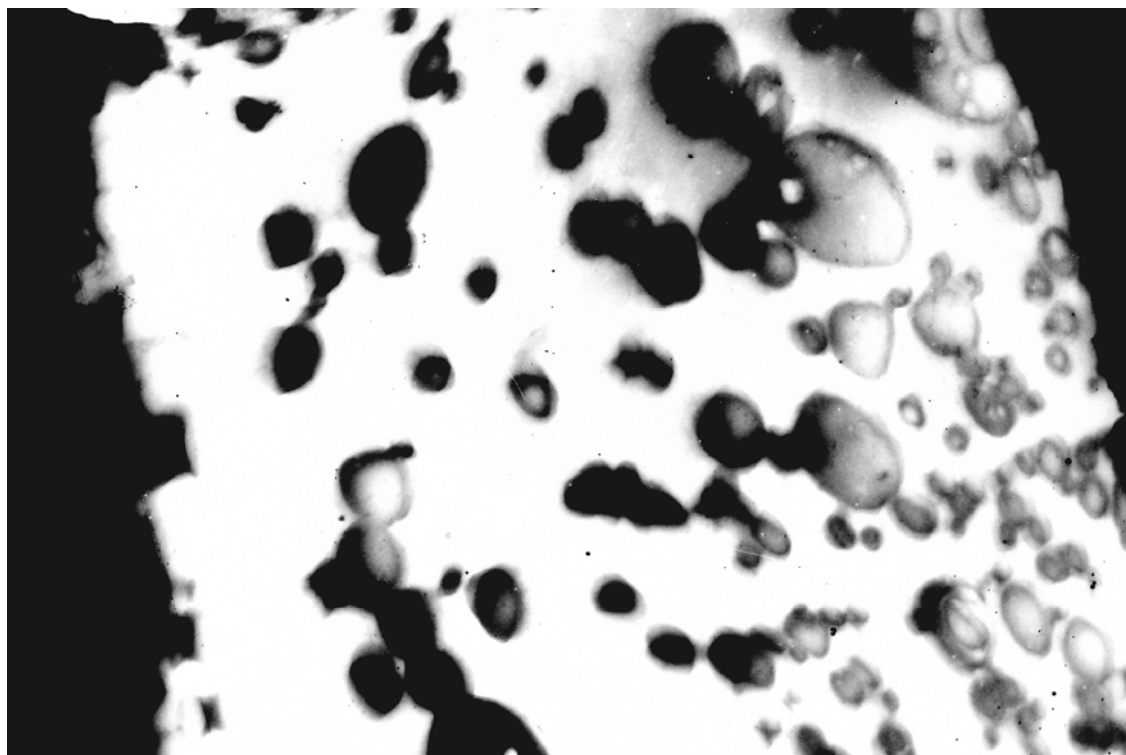
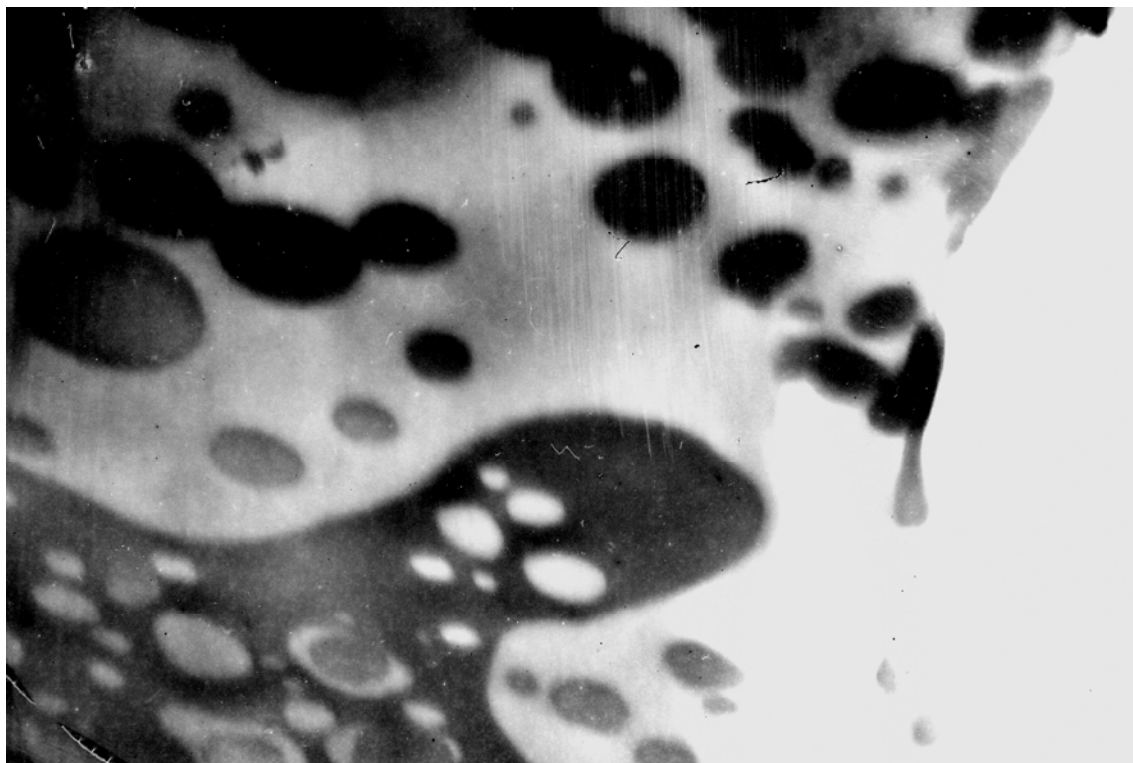


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## Bubble-like structures on the fractographic discontinuity



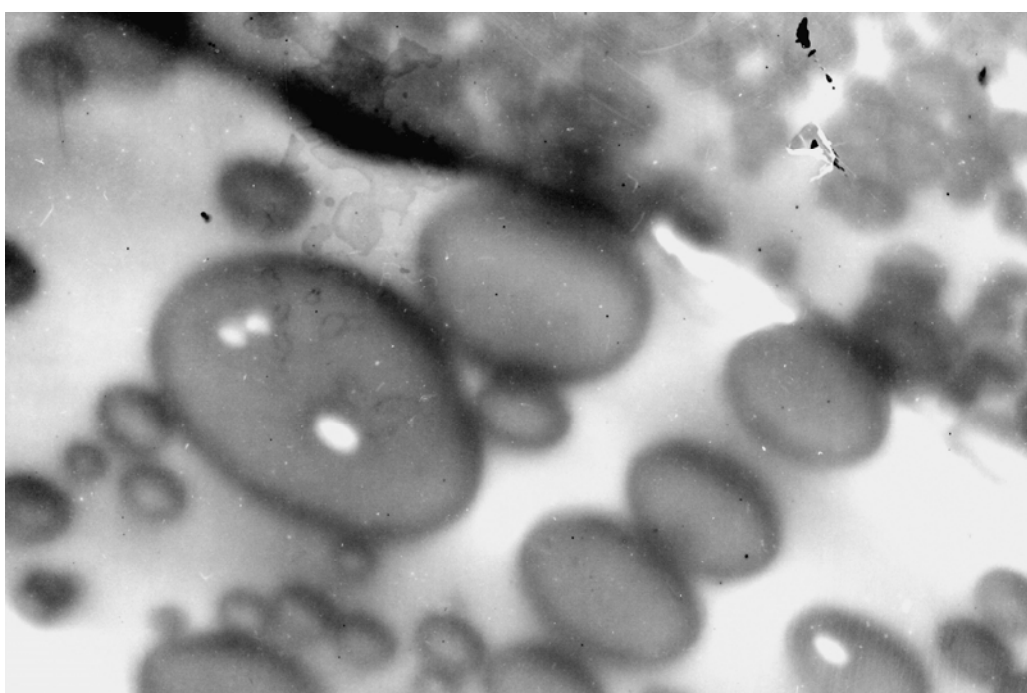
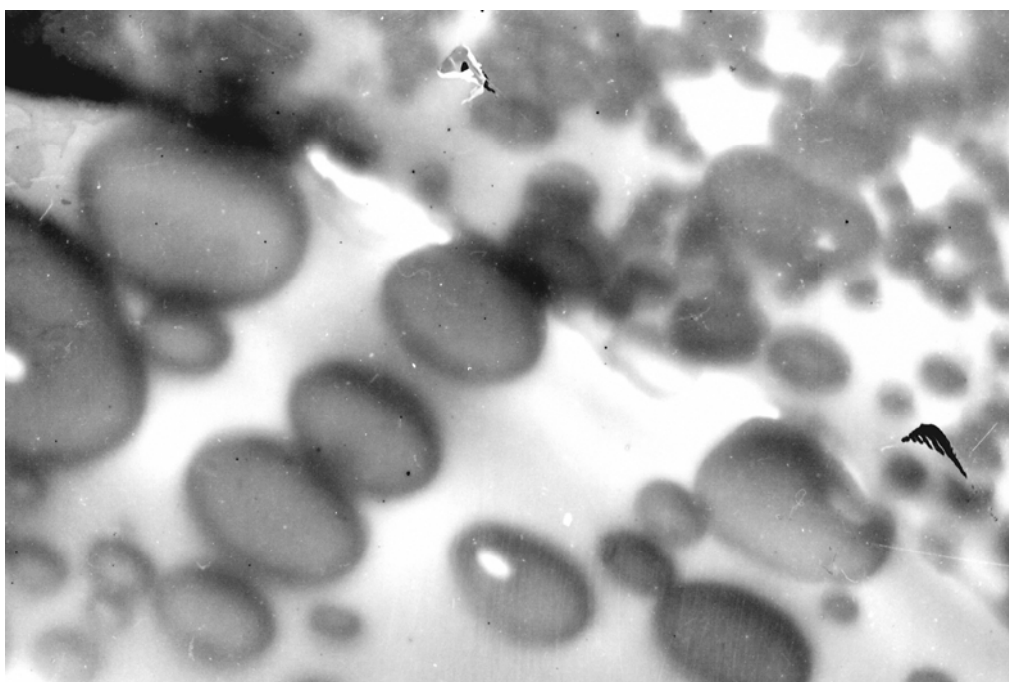
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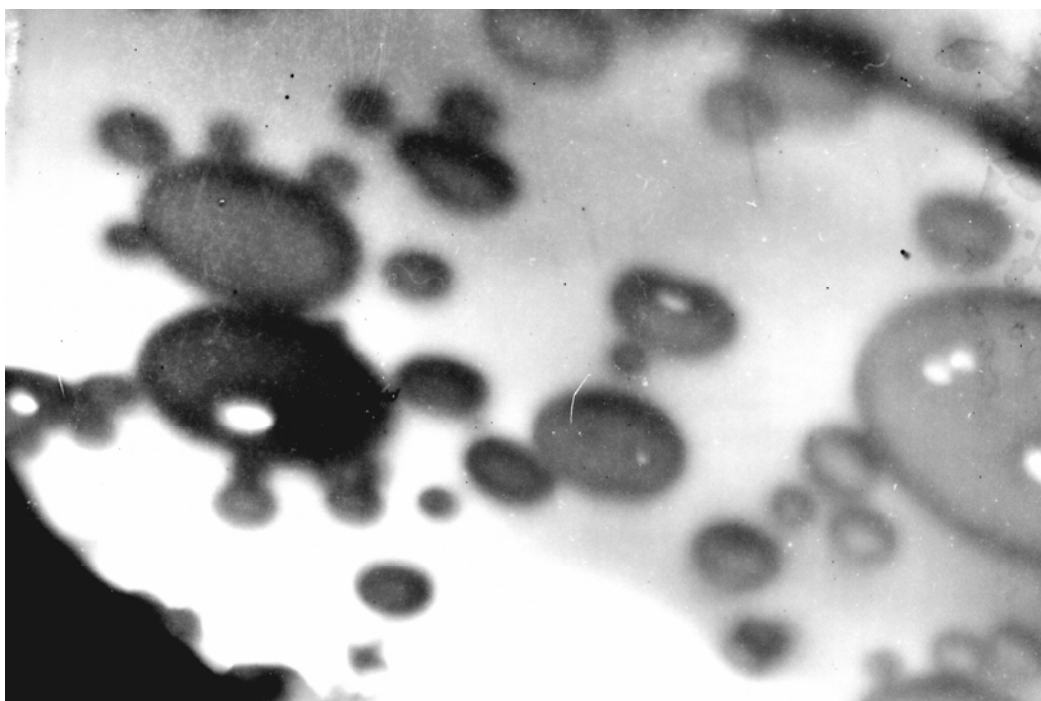
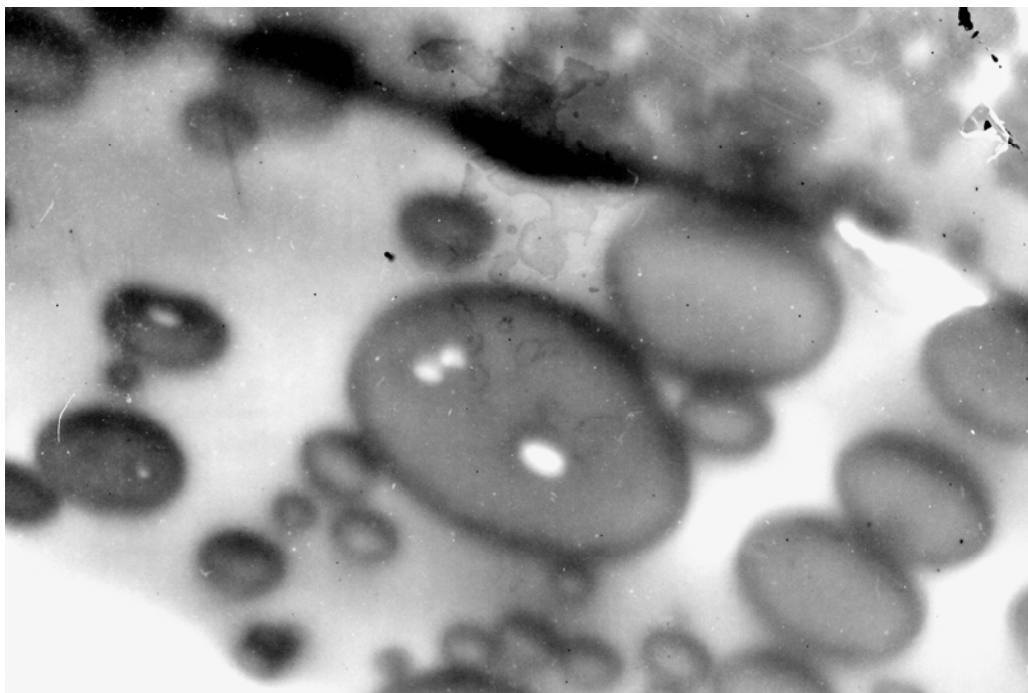
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## Bubble-like structures on the composite interface

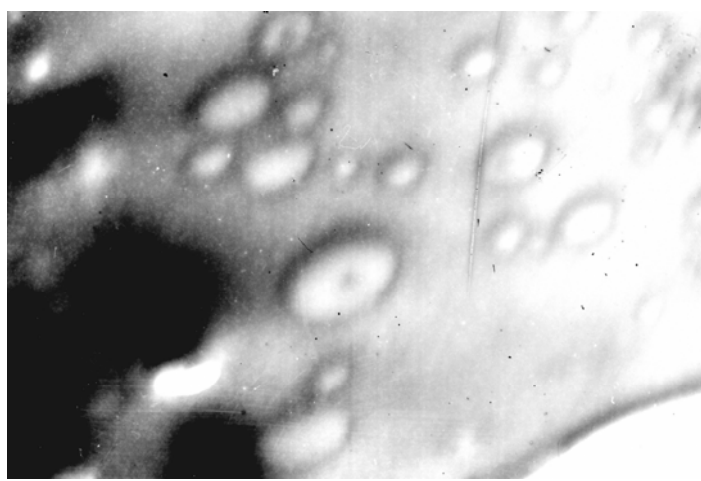
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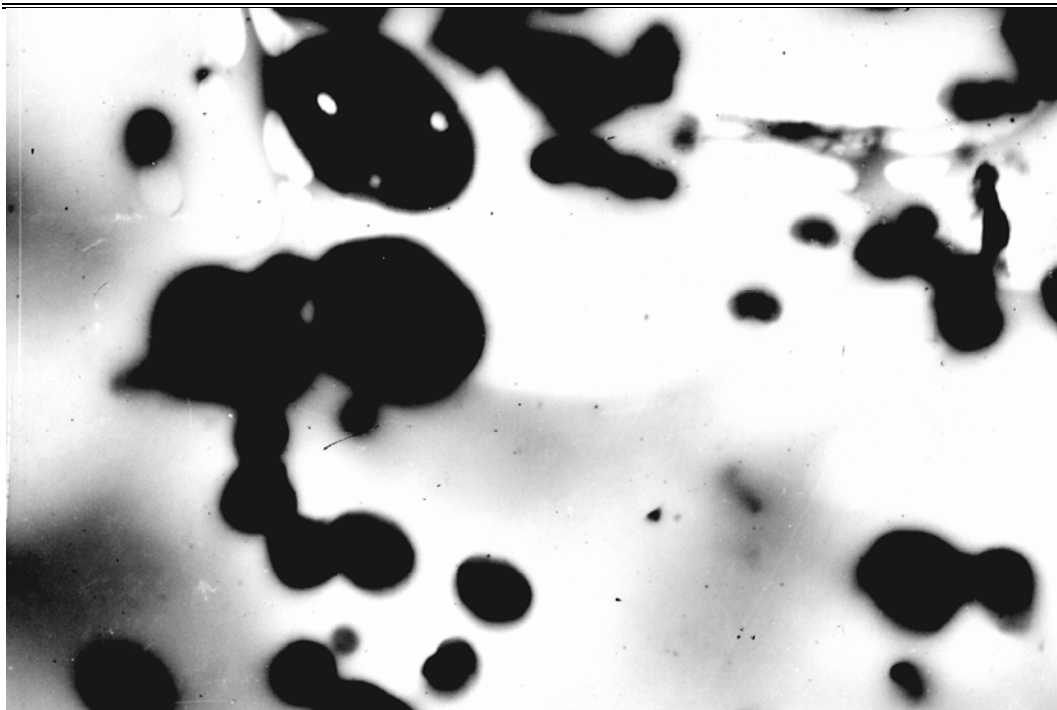
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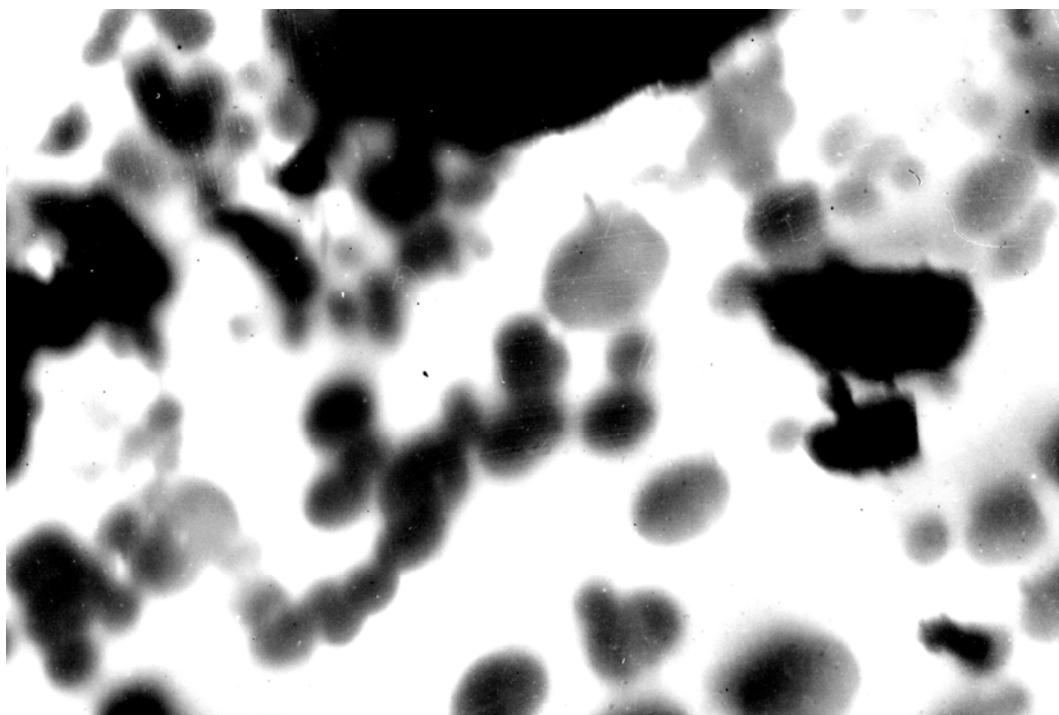
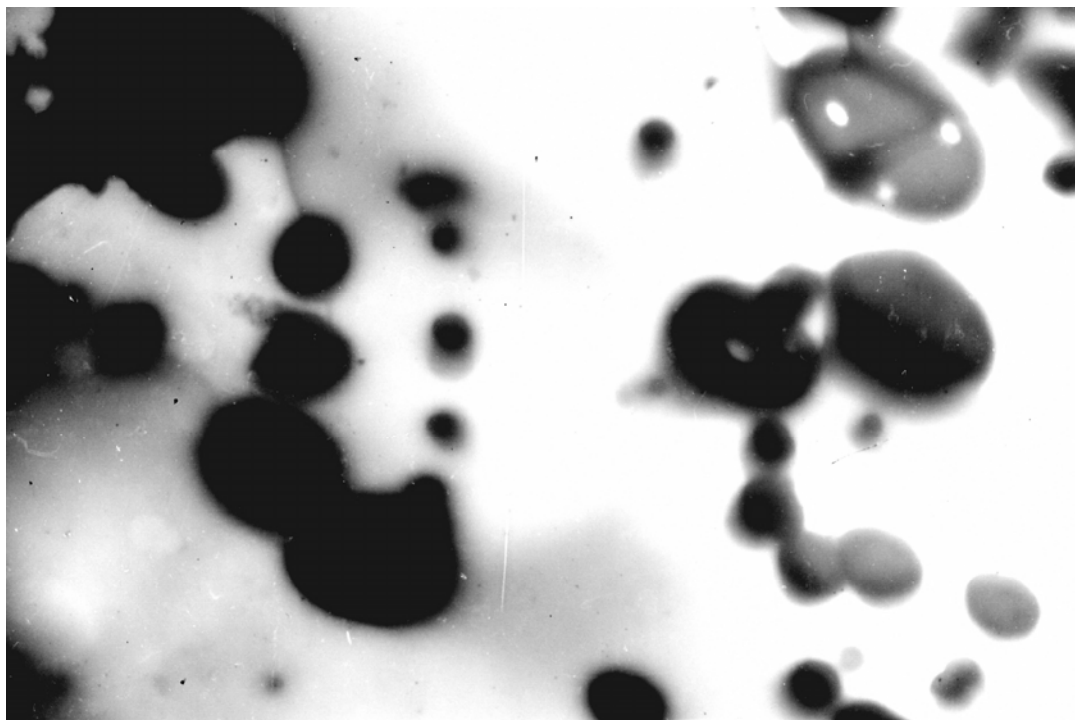
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## Chains of bubble-like structures in the polymer media

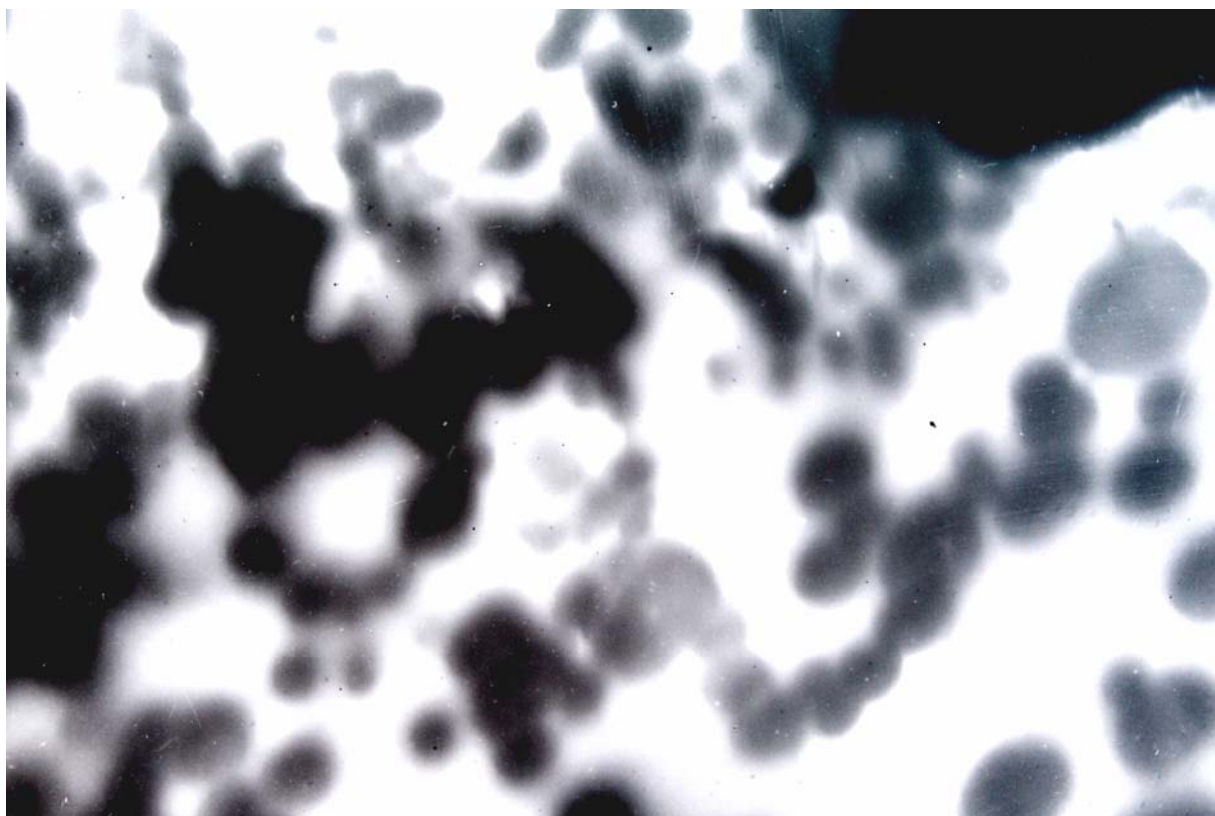
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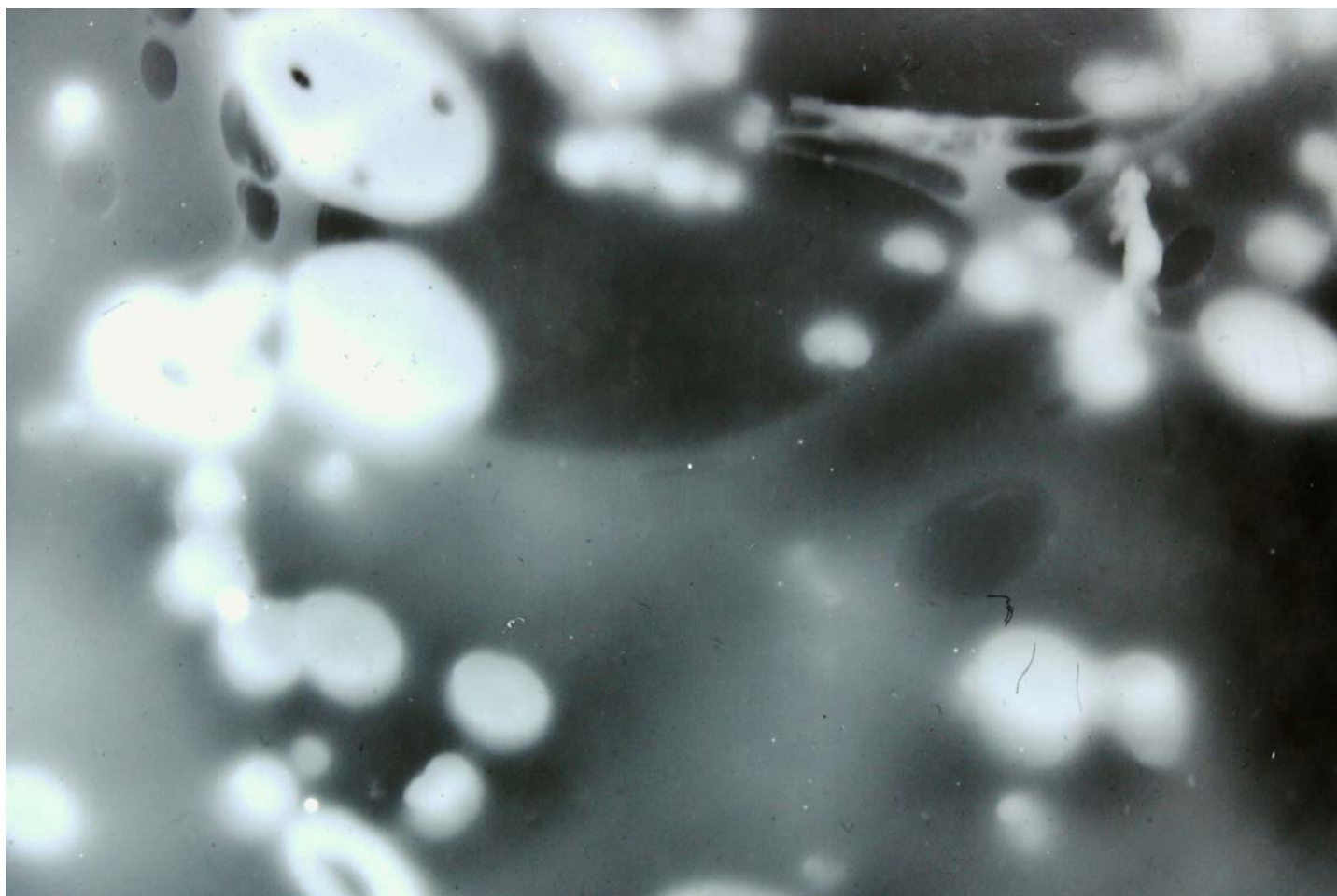
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## Exotic microfibers in the polymer media

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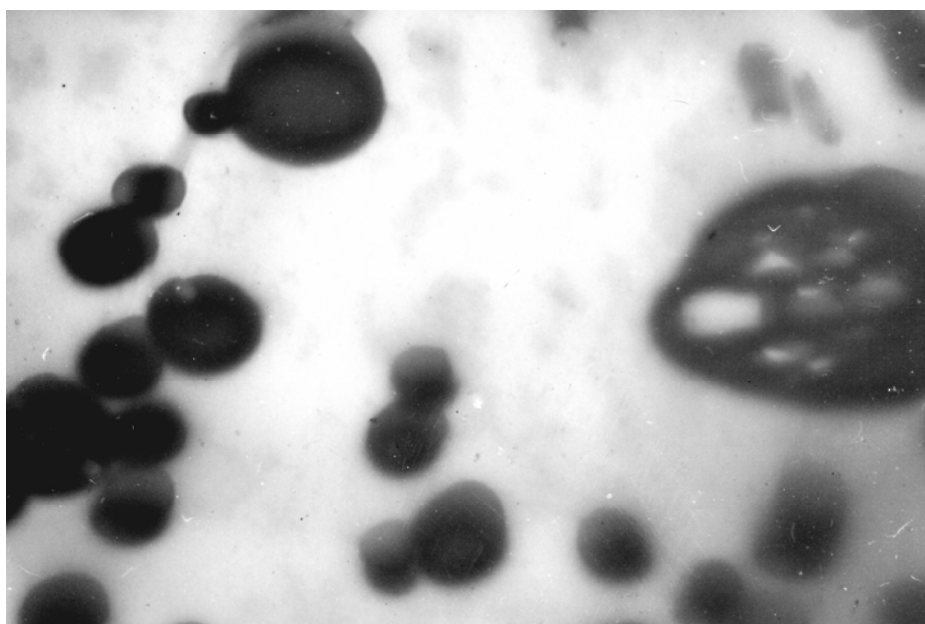
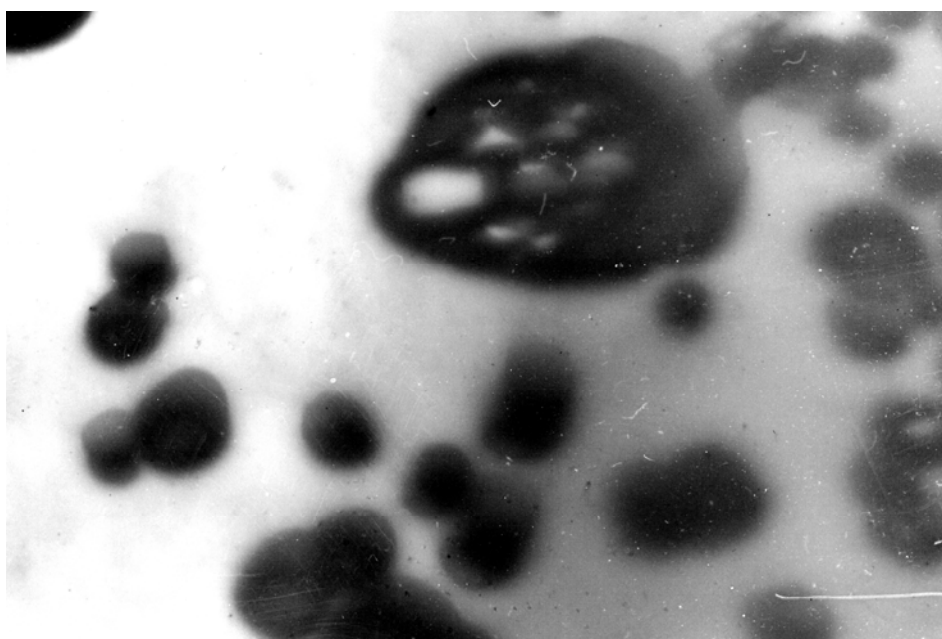


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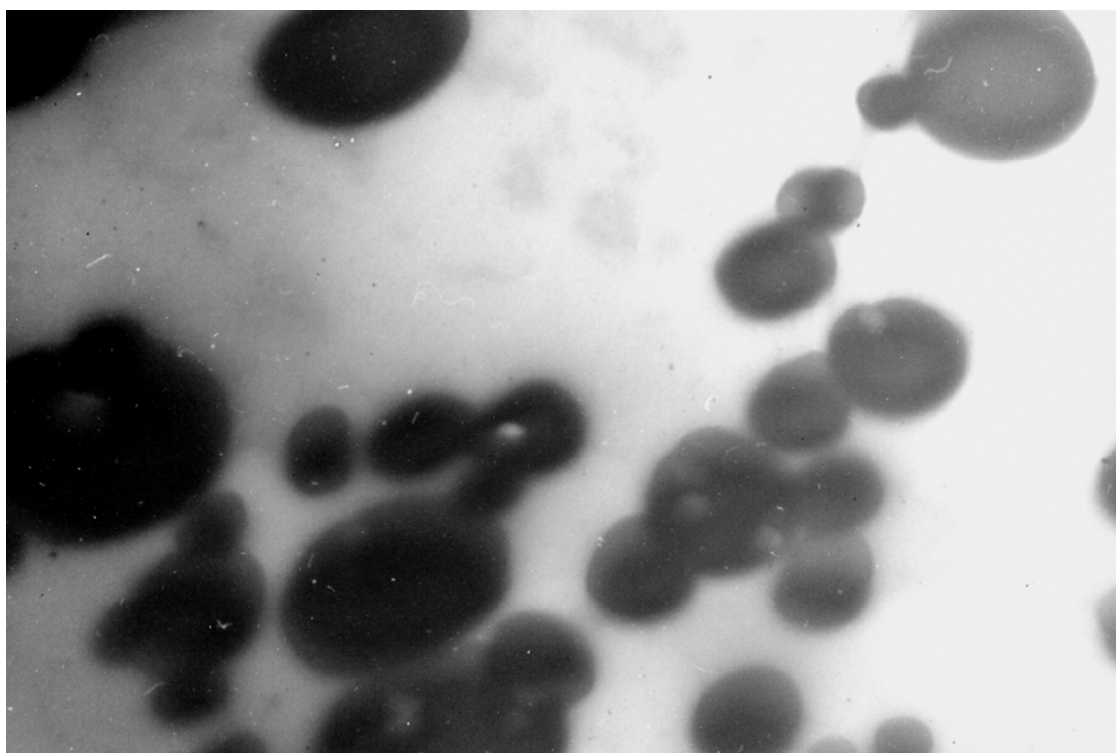
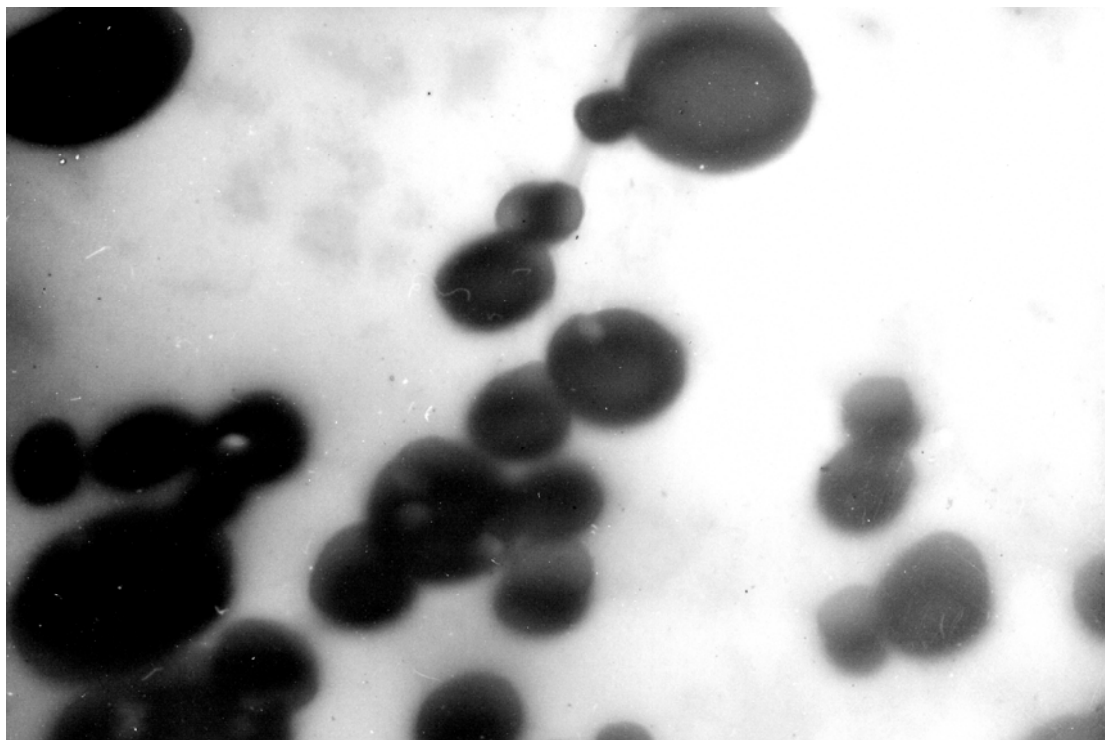


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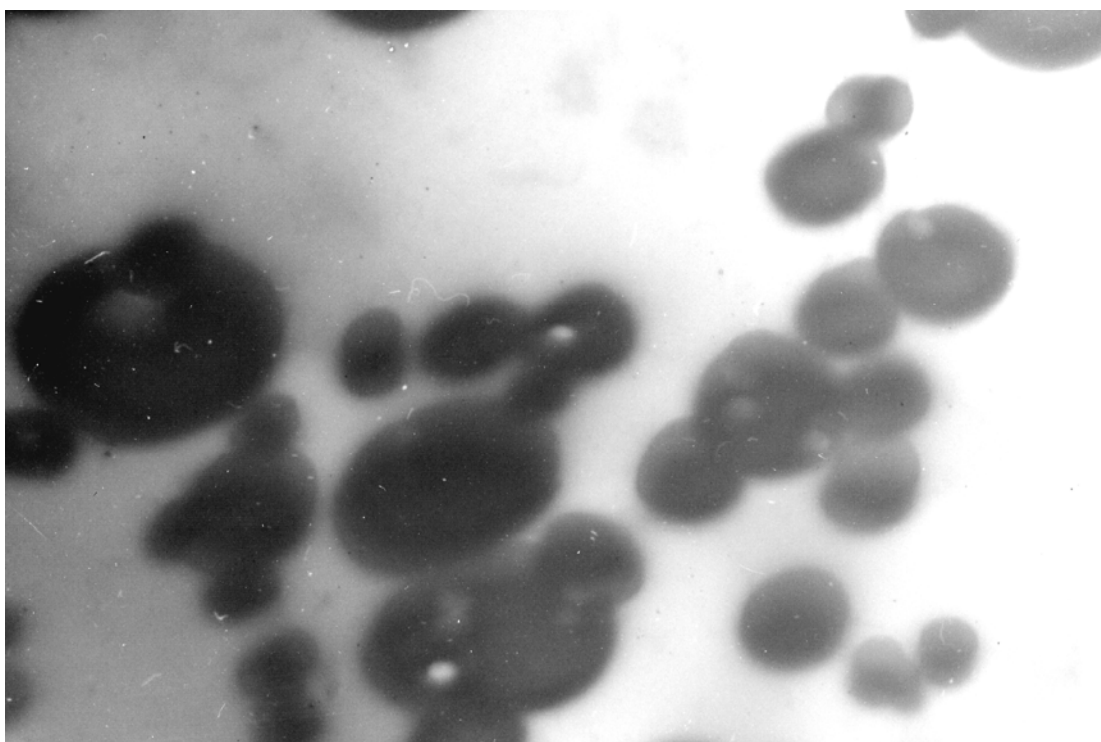
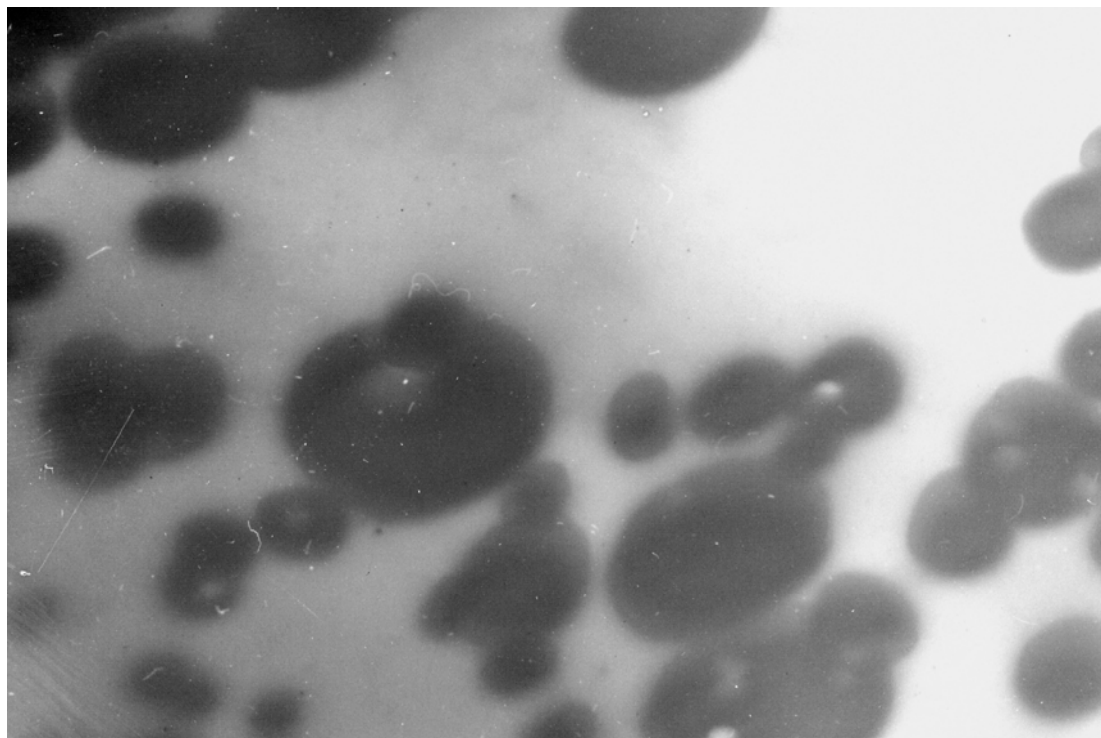
## Compartmental (“vacuolized”) ultra-microstructures and the “budding” of spherical structures in the polymer media



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