

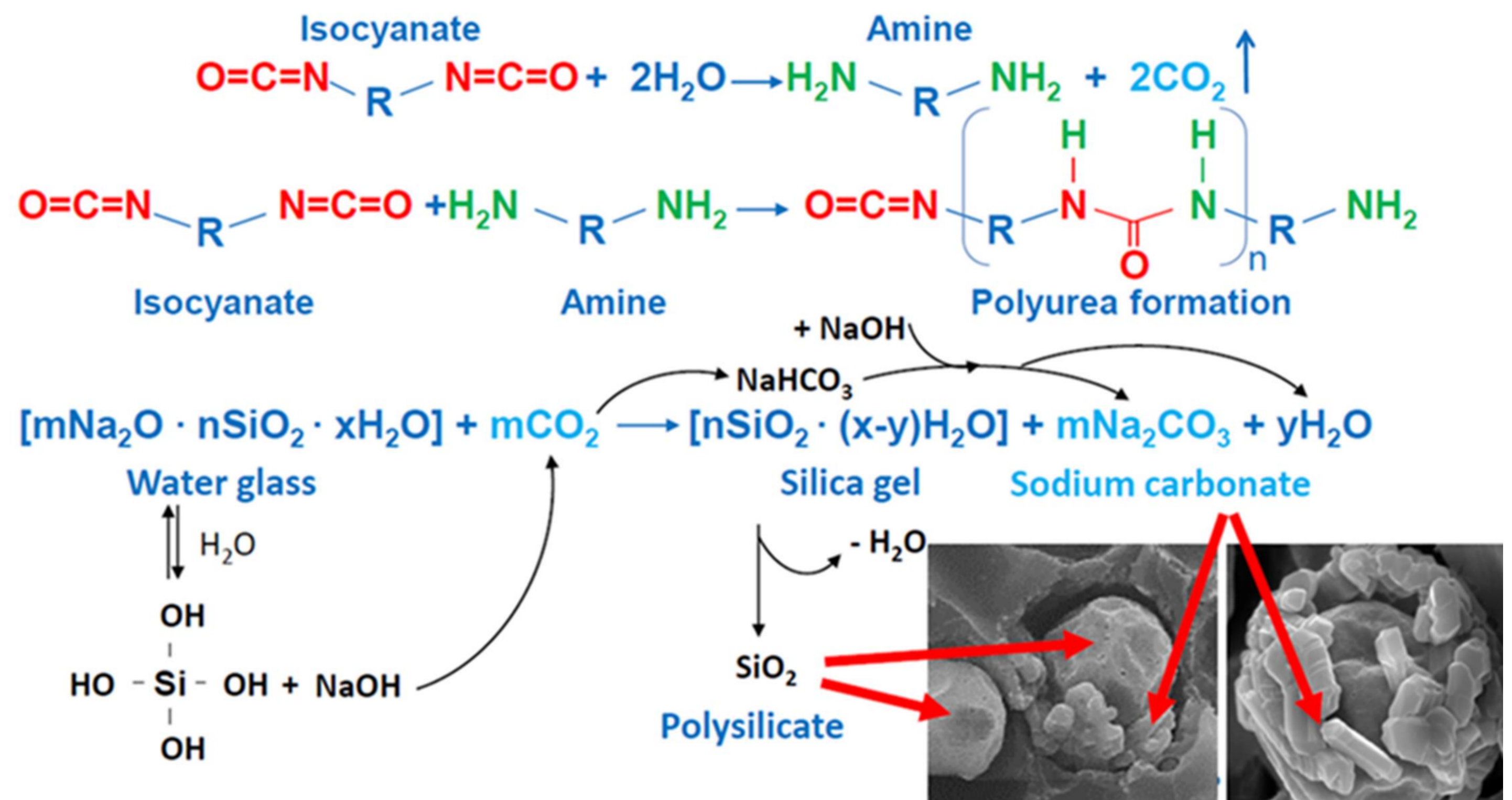
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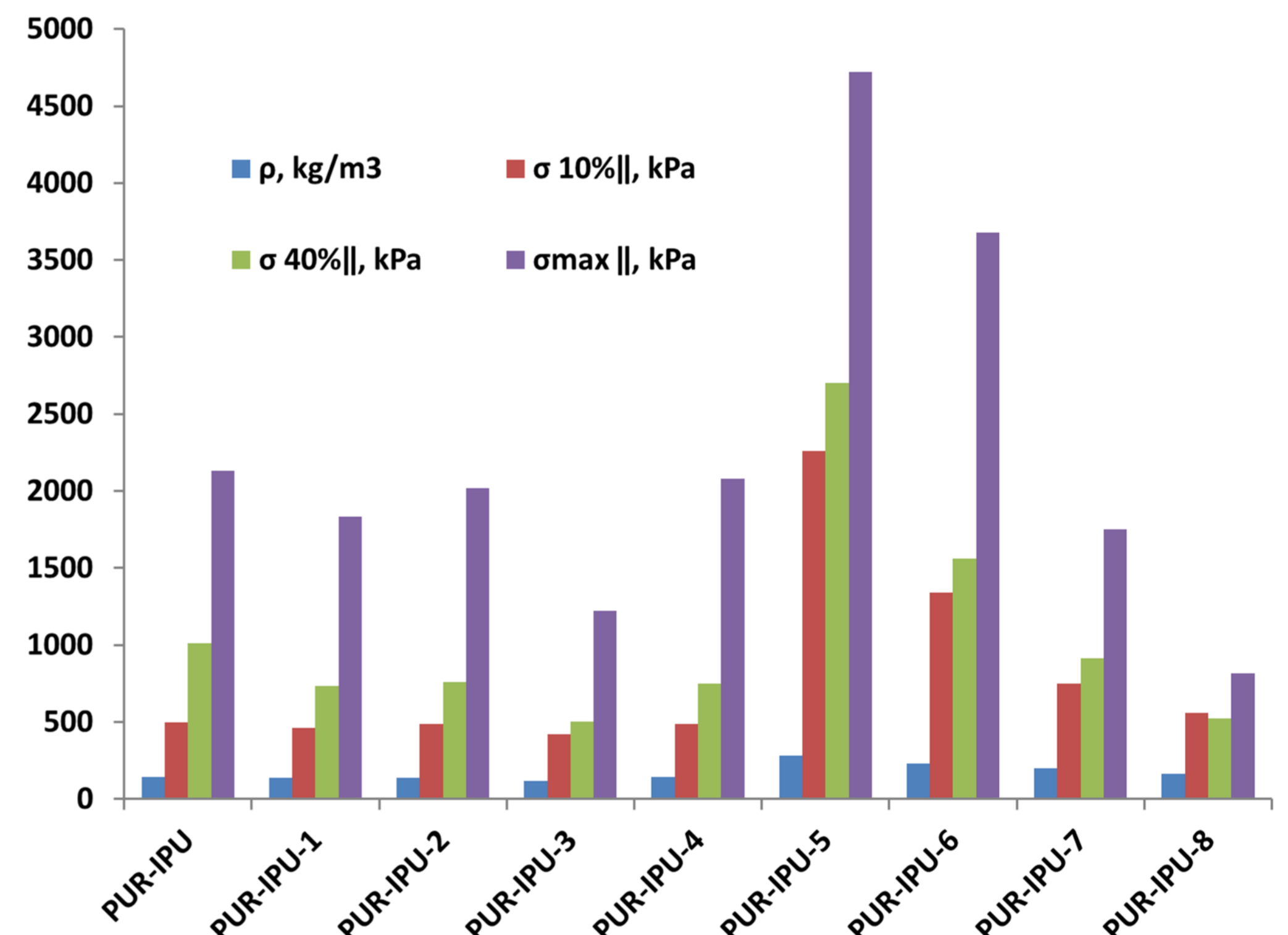
OBJECTIVES and main PRINCIPLES

- Bio-based polyols from different sources and different chemical structure
- Water glass
- Polymeric methylene diphenyl diisocyanate (PMDI)
- Bio-based isocyanate
- Organic-inorganic polyurethane/indirect polyurea/polysilicate hybrid bio-based foams
- Formation in-situ of nano/sub-micro particles (SEM-investigation) of polysilicate and sodium carbonate in PUR/IPU matrix
- Foams were prepared **without** unfavorable chemically **non-bonded organic phosphates** [1] used in common known 3P polyurea/polysilicate systems [2].



INVESTIGATIONS and RESULTS

- PUR-IPU foams were prepared from renewable resources – bio-content up to 67%
- Developed foams are suitable for in-situ formation of high performance bio-composite sandwich panels for constructive sector



- Compression tests were carried out for determination of the mechanical properties of the end-products – highest compressive strength values are observed for systems with bio-polyols based on cashew nutshell liquid (PUR-IPU-5 and PUR-IPU-6)
- Flame retardancy was evaluated after flammability tests

REFERENCE:

- Grishchuk S., Castella N., et al. Hybrid resins from polyisocyanate/vinyl ester/water glass systems: Structure and properties // European Polymer Journal.- 2007.-43.-P. 1245-1257.
- Nagy et al.: US Patent No: 5,622,999: "Polysilicic acid/polyisocyanate basic materials, binding materials and foams and process for preparing same." Priority date: 3 June, 1997 [HU]. (DE: P 41 21 153.7).

ACKNOWLEDGEMENTS

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