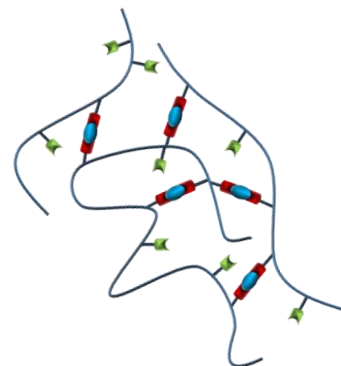


**Design and Characterization of Novel Double
Dynamic Networks Based on Reversible
Covalent Bonds.**



ESR 3

Larissa Hammer

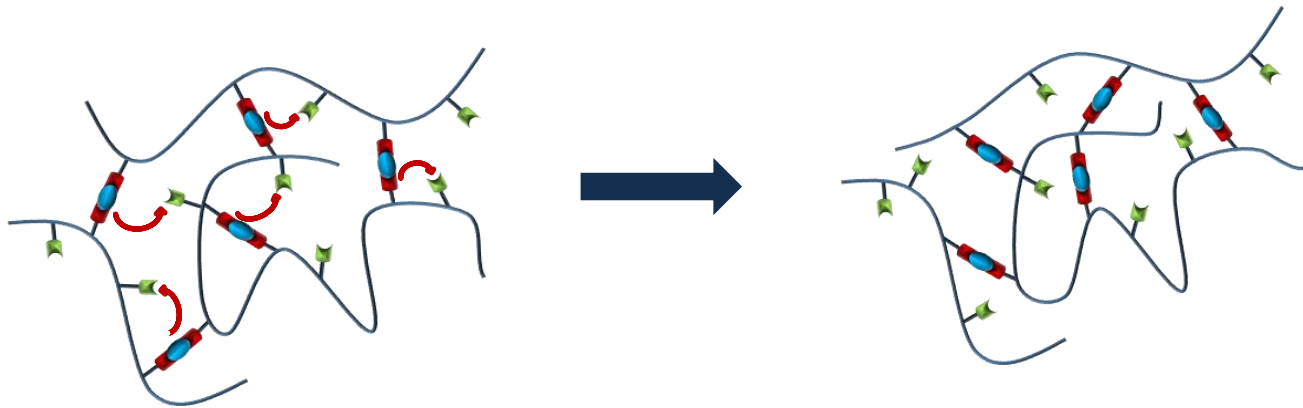
06/2018-05/2021

DOOR INITIAL TRAINING NETWORK *net*

- Born and raised in Germany
- Bachelor Degree in pure Chemistry at KIT Karlsruhe
- Consecutive Master Degree
 - Focus: Polymer Chemistry
- Research Internship at QUT, Australia
- Industrial Internship at BASF, Germany
- Main expertise: **Synthetic polymer chemistry**



- Design and synthesis of new Double Dynamic Networks
- Employing dynamic covalent bonds
 - Boronic ester exchange or imine exchange reactions



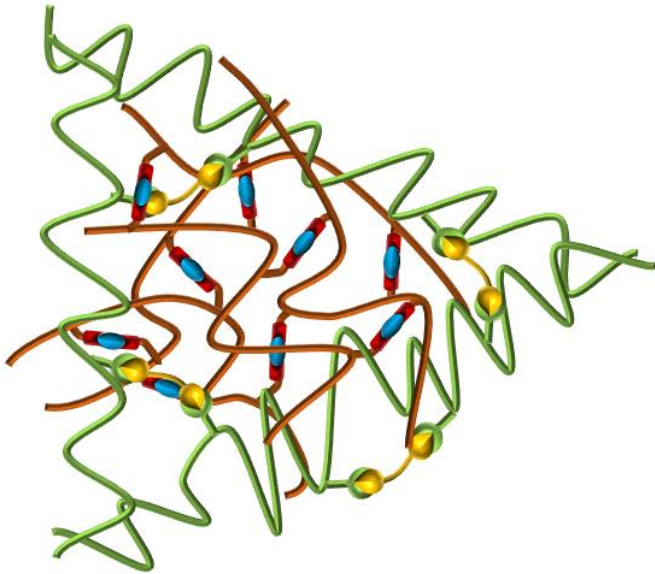
Vitrimeric bonds:

- Associative mechanism
- New linking point involved in reaction
- No bond breaking
- Same amount of cross-links

Material:

- Self-healing
- Reprocessable
- Tough
- Malleable
- Maintains network integrity

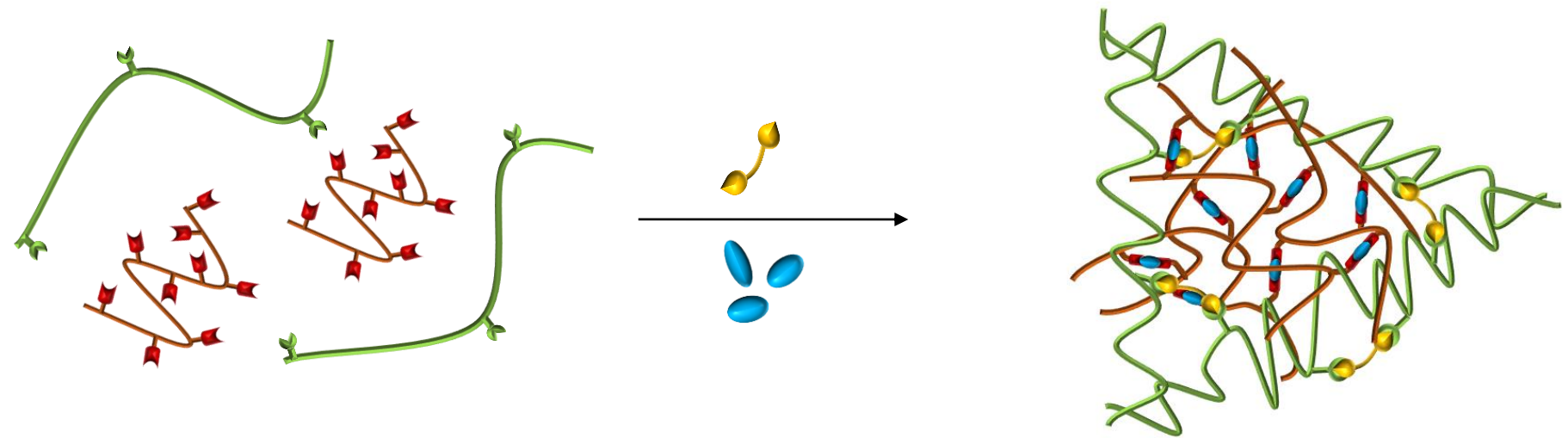
Double Networks



Thermoplastic Elastomers

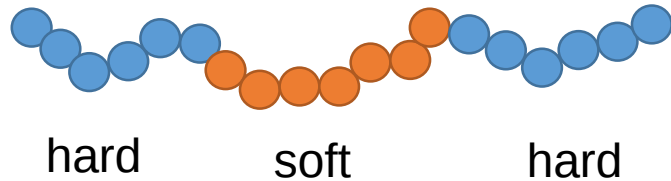


JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

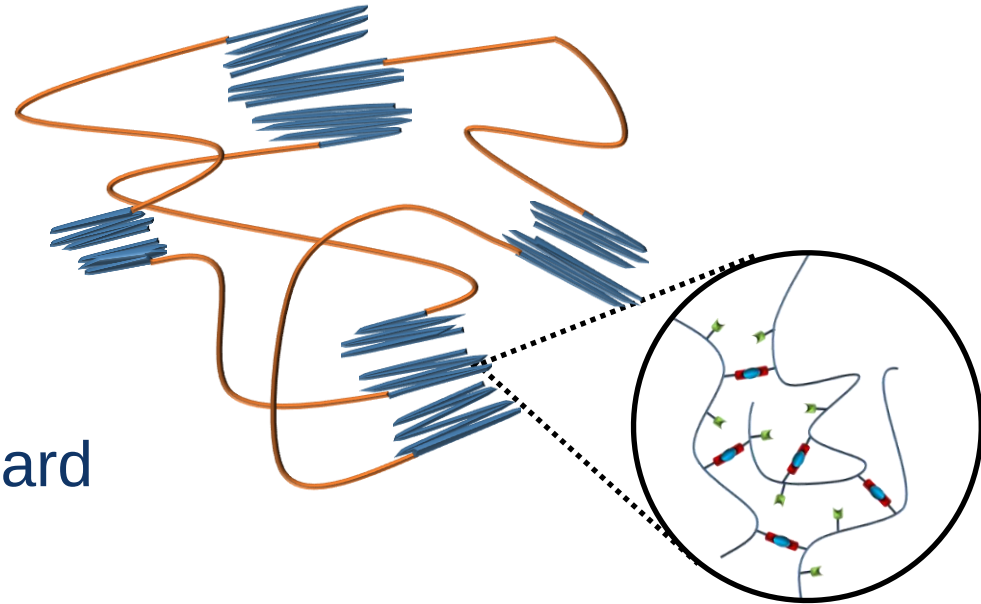


- Design of two thermoplastic precursors
 - Simultaneous, orthogonal cross-linking
 - Double Network, two dynamic modes
-
- Results
 - Precursors synthesized
 - Cross-linker synthesized
 - Started cross-linking exp.
 - Outlook
 - Detailed cross-linking studies
 - Creation of Double Network
 - Testing

- A-B-A triblock copolymer



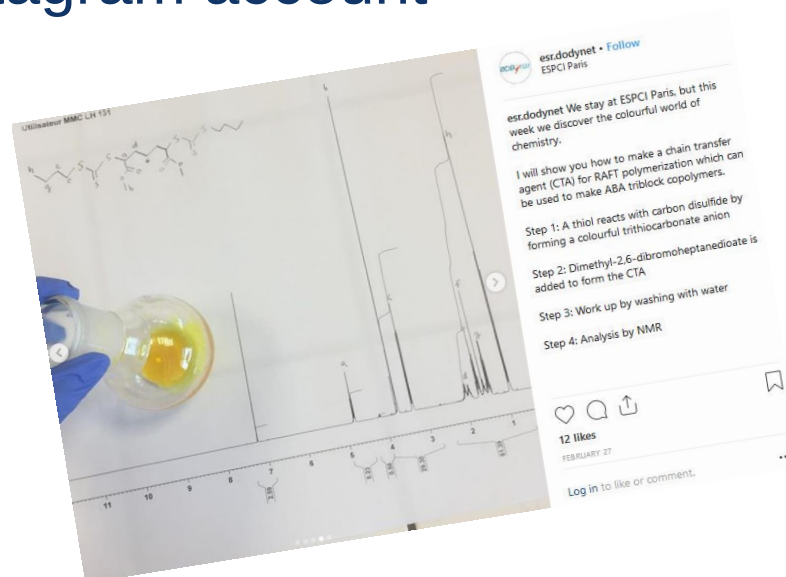
- Microphase separation
 - One dynamic below T_g of hard phase
- Decorate hard phase with dynamic covalent bonds
 - Second dynamic mode, retain structure above T_g



-
- | | |
|--|--|
| <ul style="list-style-type: none">• Results<ul style="list-style-type: none">– Synthesized building blocks– First polymerization exp. | <ul style="list-style-type: none">• Outlook<ul style="list-style-type: none">– Synthesize soft, hard blocks– Analysis– Scattering exp. at JGU, Mainz |
|--|--|

- Visiting several French classes
- PhD Training
 - Public Speaking
 - FLE: Communication scientifique écrite et orale
 - Developing your career by networking
 - Boost your career by using social networks

- Presented research in internal group seminar
- Contributed to DoDyNet Instagram account



- Conferences:
 - Planned 05/2019: 9th EPF Summer School “**DYNAMIC AND REVERSIBLE POLYMER NETWORKS**”

- Academic Secondment: UCL, Louvain



- Industrial Secondment: tesa, Hamburg



- Collaborations with other partners

- Future Career Plan:

- Graduate in Summer 2021
- Industrial Research, Research Management

Thank you for your attention!



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