



MC3

Teaser

**Industrial
Macromolecular
Chemistry**

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Structural polymers have changed the world

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In the late 1950s, **Tupperware** found out that household goods made of polyethylene sold best in private homes by independent saleswomen

Nylon 6,6:
On Mai 15th, 1940 the first 800.000 pairs of stockings were sold – made of a new polymer from DuPont.
Inventor: Wallace H Carothers



1951
Polypropylene
Phillips

1954
PET
Dupont

≈ 1955
HDPE
DuPont, Phillips

1957
Polycarbonate
General Electric

1964
Polyphenylene
oxide
General Electric

Coca Cola:
Glass bottle since 1915,
PET version since 1993.



Content of Industrial Macromolecular Chemistry

Part I – Structural polymers

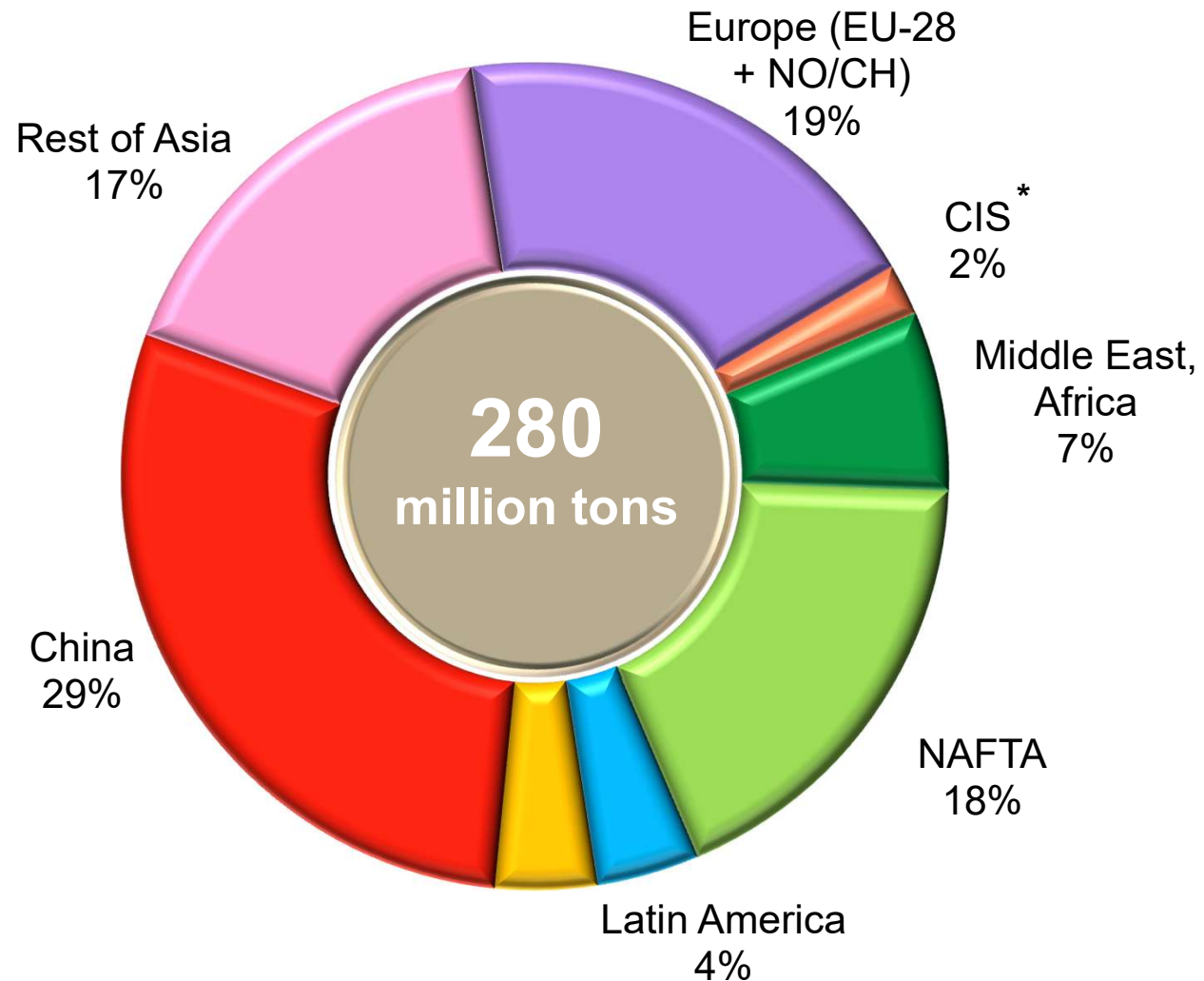
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1. Commercial relevance of polymers
2. From crude oil to monomers
3. Value chains
4. The importance of strategic thinking
5. Polymer process technology
6. Polyethylene – LDPE, HDPE
7. Polystyrene – GPPS, EPS, HIPS, SBC
8. Plastics test methods
9. Development of new thermoplastics
10. Innovation management
11. Biopolymers
12. Polyurethanes
13. Polymers in the environment
14. A look at business management – Basic terms, cost accounting, economies of scale, finding the right price)

World plastics production 2016

Thermoplastics and polyurethanes

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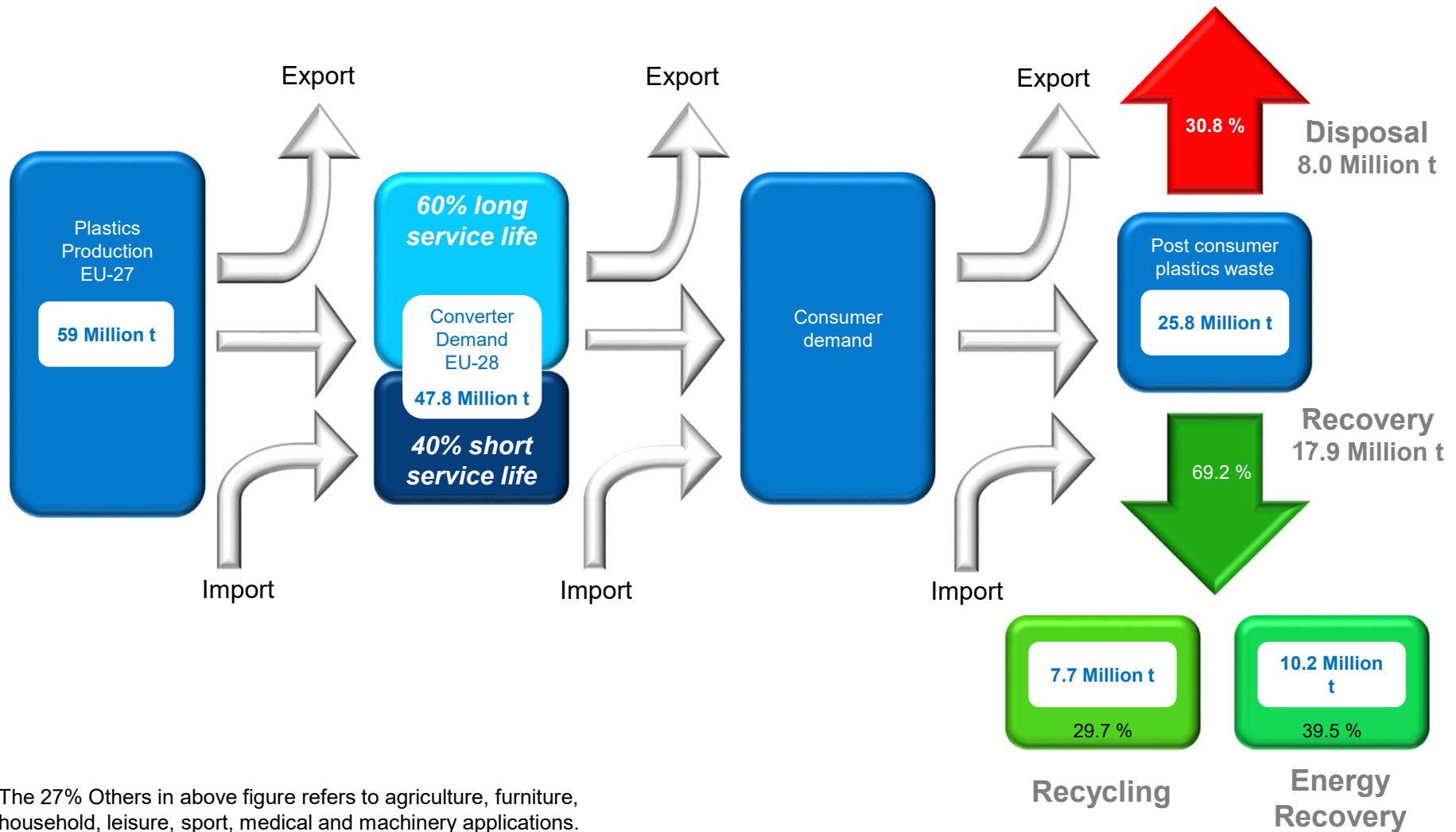


* Commonwealth of Independent States

Life cycle of plastics in 2014

EU-28 + NO/CH

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The 27% Others in above figure refers to agriculture, furniture, household, leisure, sport, medical and machinery applications.

Content of Industrial Macromolecular Chemistry

Part II – Functional polymers

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1. Structure-effect relationships

2. Polymers for hair care

3. Intellectual property – Part 1

4. Polymers for pharmaceutical applications

5. Emulsion polymerization

6. Intellectual property – Part 2

7. Additives for fuels & lubricants and PIB

8. Intellectual property – Part 3

9. Polymers for laundry care

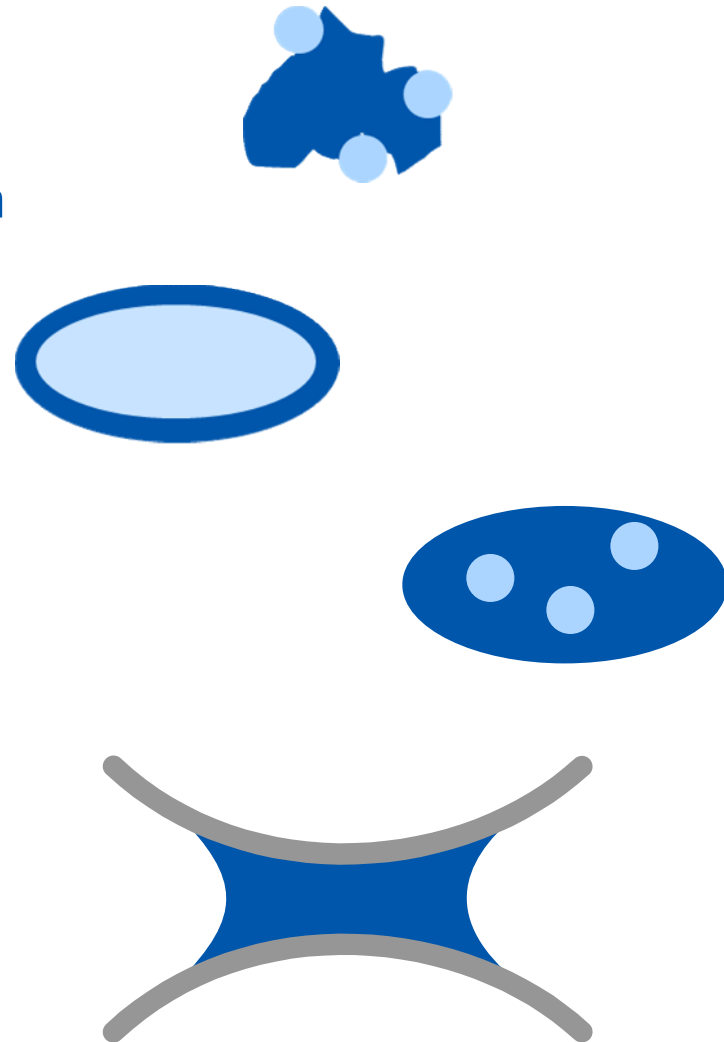
10. Superabsorbent polymers

Translate market needs into properties

Tasks for solid functional polymers

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- Adsorb molecules/ions from solution
- Absorb liquids
- Protect/coat solids/liquids
- Dissolve molecules
- Release molecules (controlled)
- Connect solids
- Modify surface properties

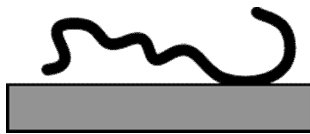
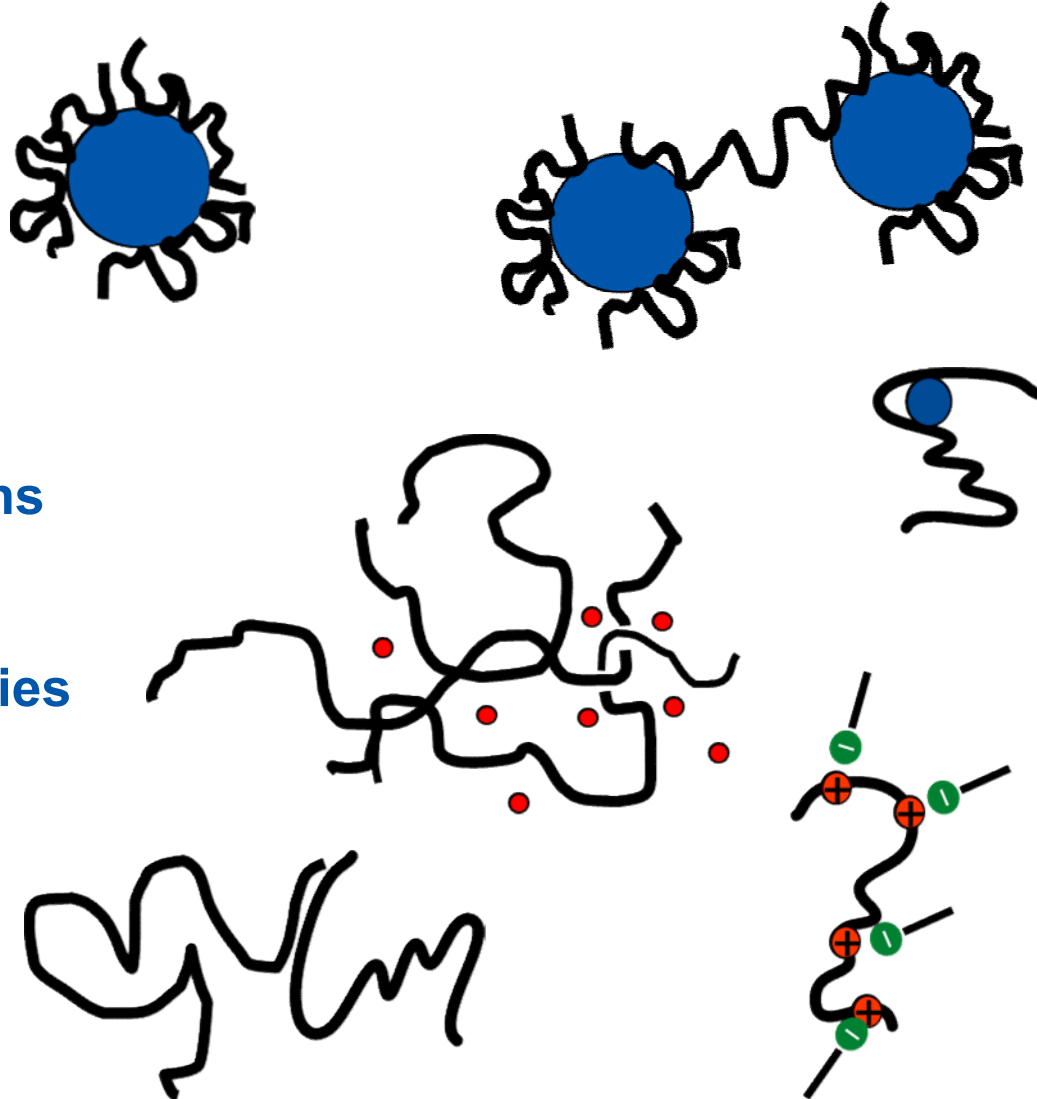


Translate market needs into properties

Tasks for dissolved functional polymers

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- Disperse particles
- Flocculate particles
- Solubilize molecules
- Complex molecules/ions
- Modify rheology
- Modify surface properties



Problem solvers in everyday life

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