ENGINEERING MATERIALS
BMM1523

POLYMERIC MATERIALS

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Description

- **Aims**

  To study the classification of polymers and its properties.

- **Expected Outcomes**
  - Student will be able to describe the classification of polymers
  - Student will be able to understand the properties of thermoplastic and thermoset

- **References**

1. William D. Callister and David G. Rethwisch. Materials science and enginnering: An Introduction, 9th Ed. Wiley, 2014

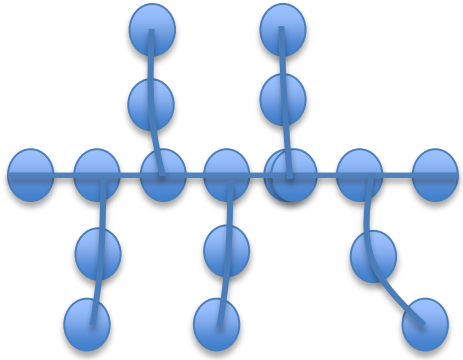
Introduction

Polymer

- A chemical substance which has molecular structure made of a repetition units of (mostly) hydrocarbon (C and H) and bonded with the following elements with O, N, S, Cl, F, P, or Si.

Poly = many

Meros (mers) = part / unit

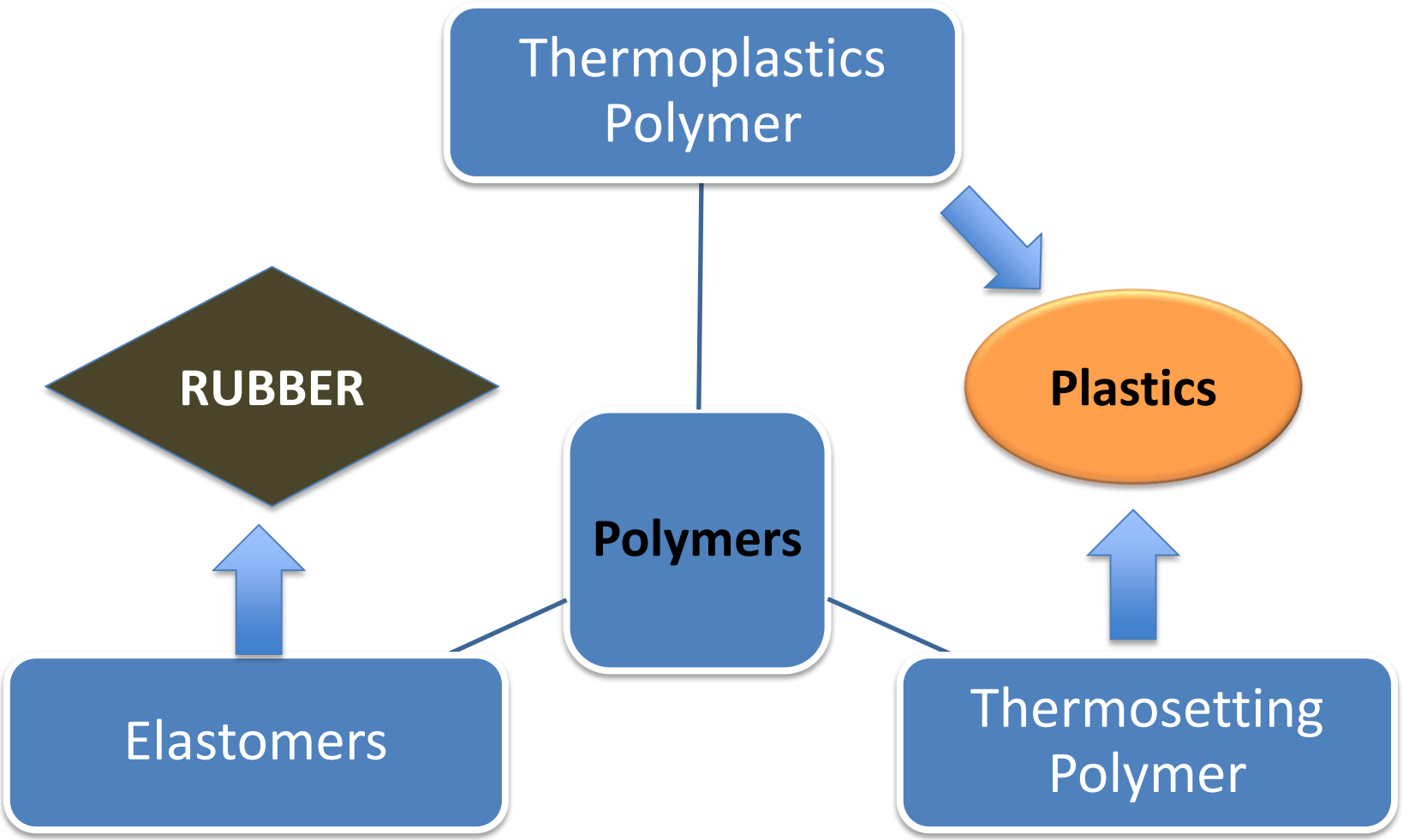


Why are Polymers so Important?

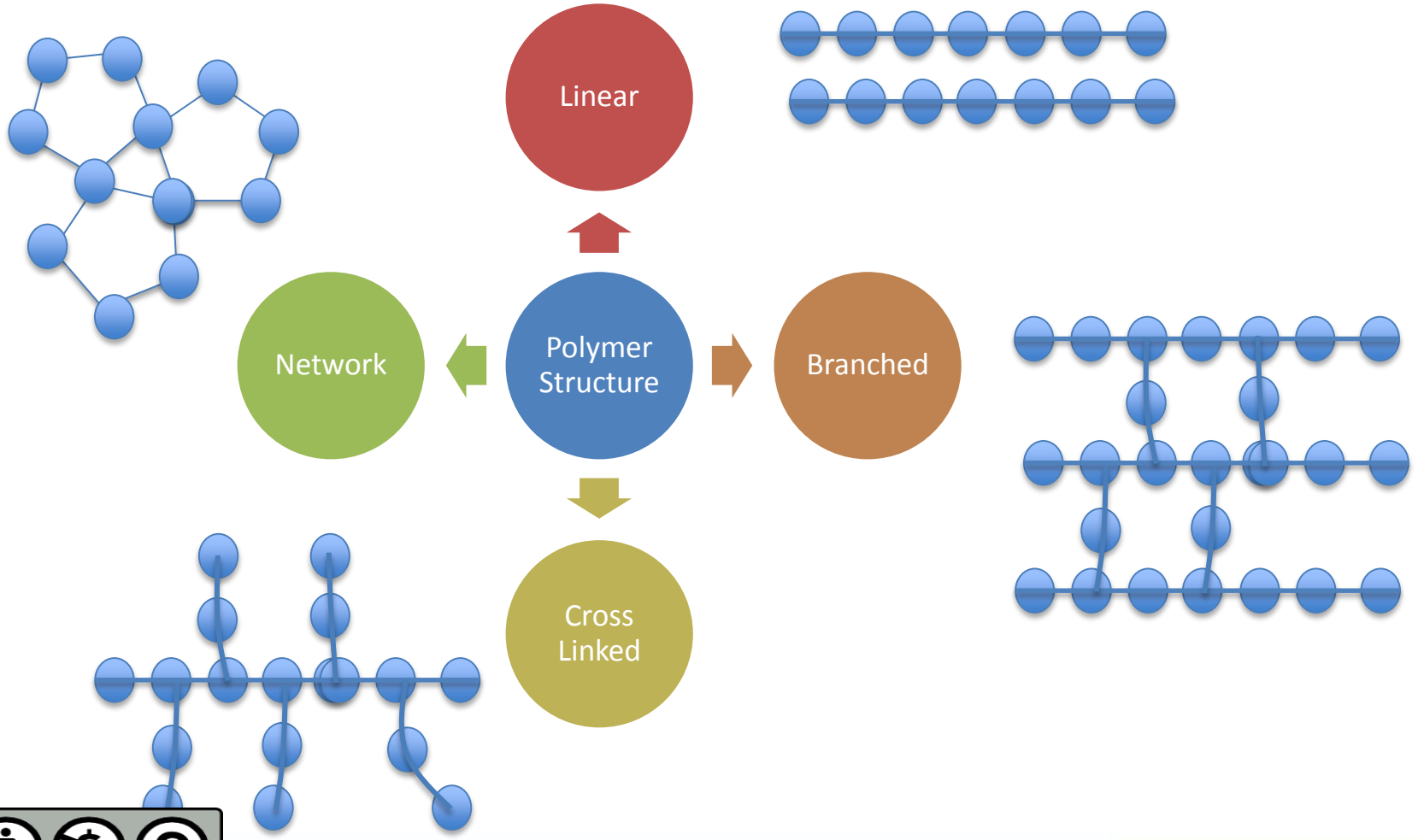
- **Advantages of polymers**: lightweight, can be processed in various ways, high strength to weight ratio, and resistant to chemicals

- **Many applications** such as packaging, automotive part, medical equipment, electrical component, and electronics part made from polymers.

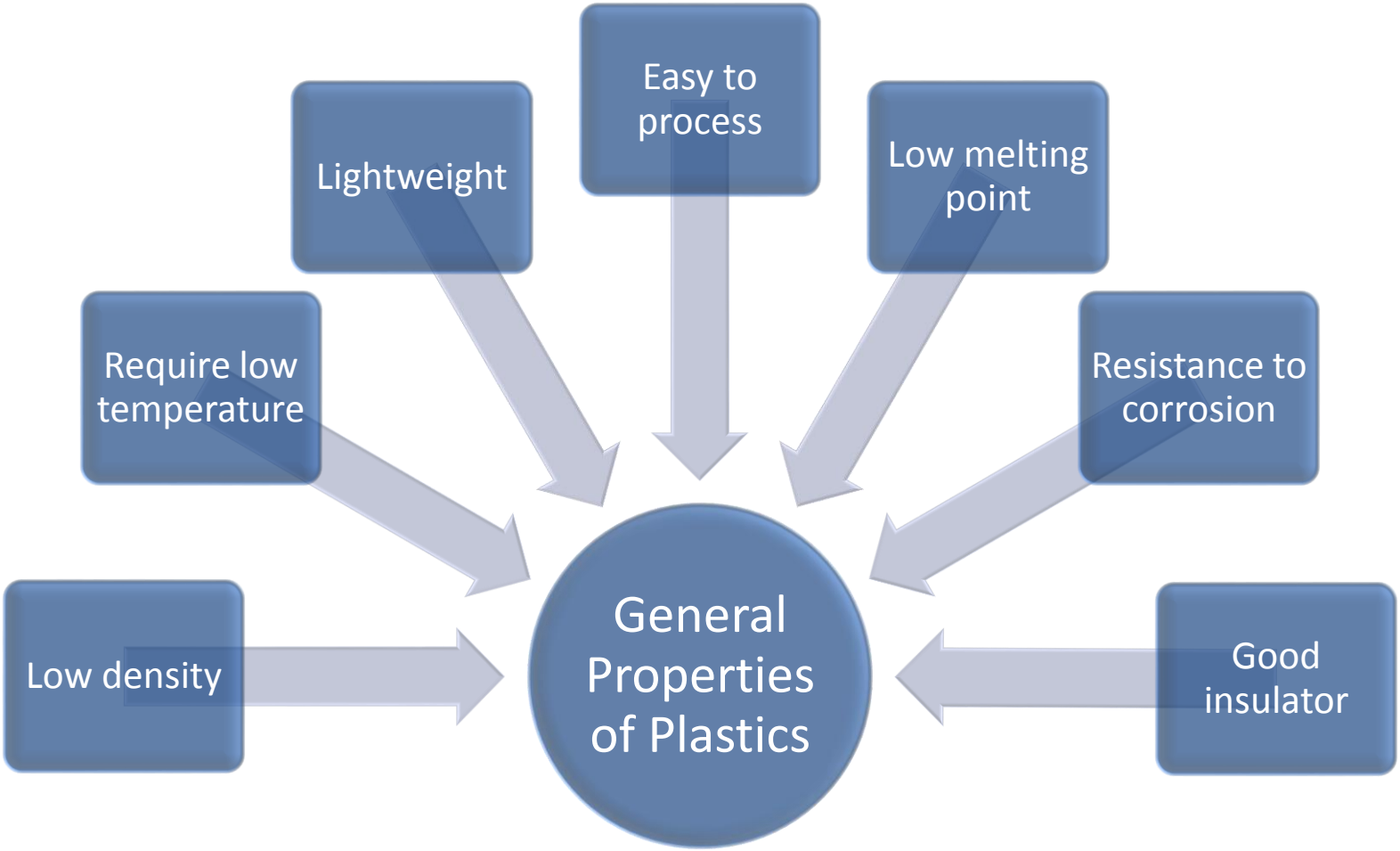
TYPES OF POLYMERS



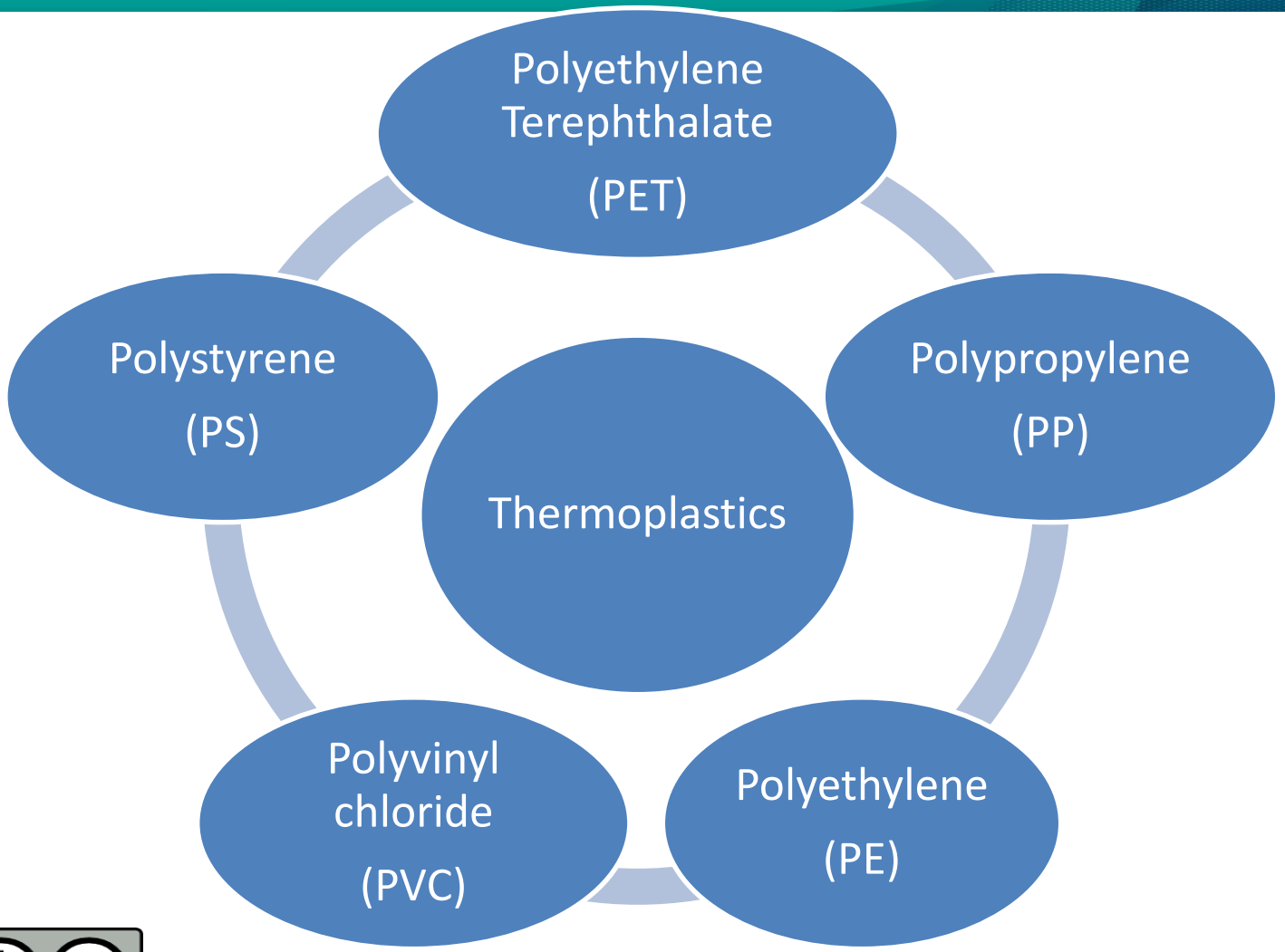
CHAINS STRUCTURE OF POLYMER



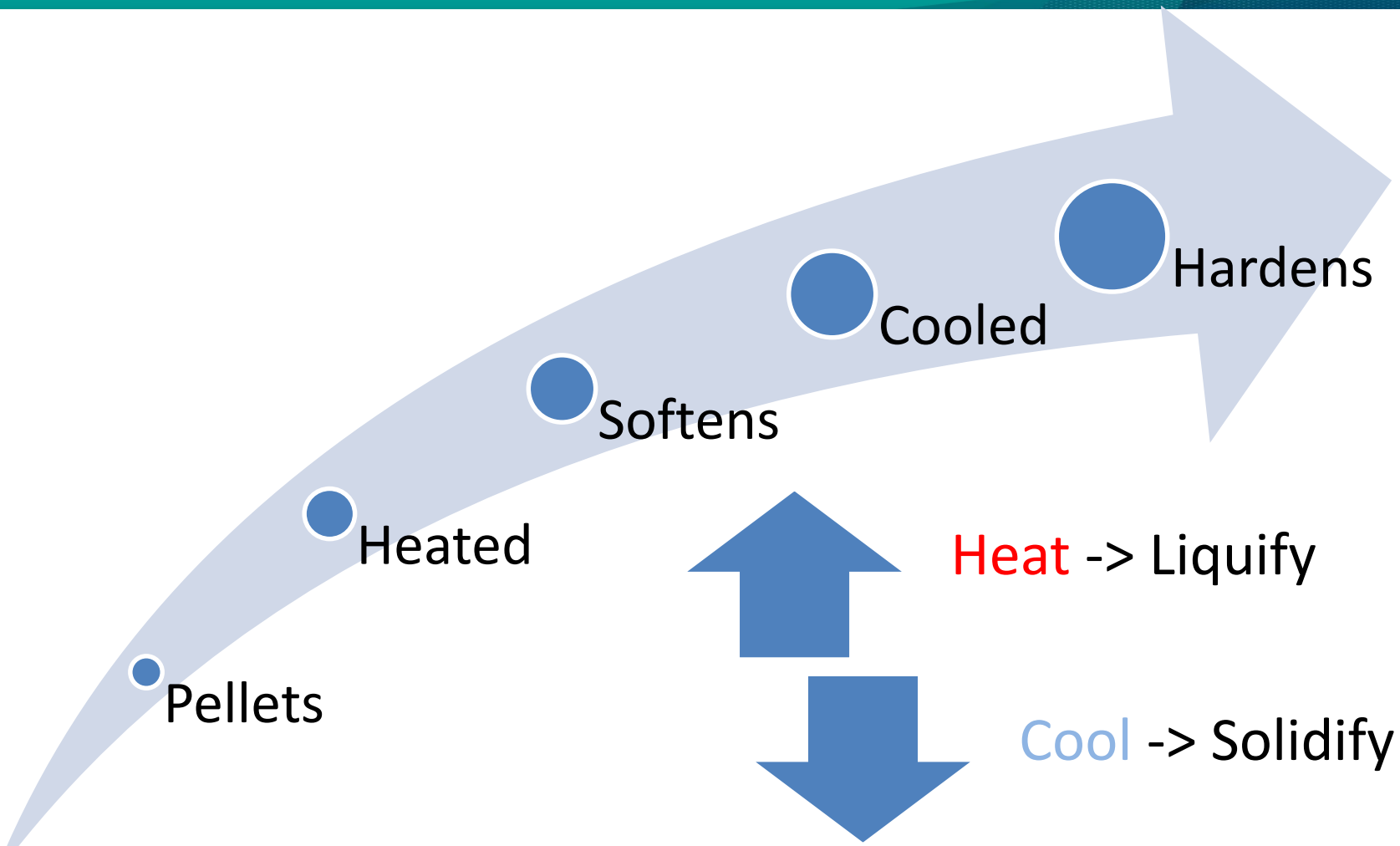
GENERAL PROPERTIES OF PLASTICS



Thermoplastics



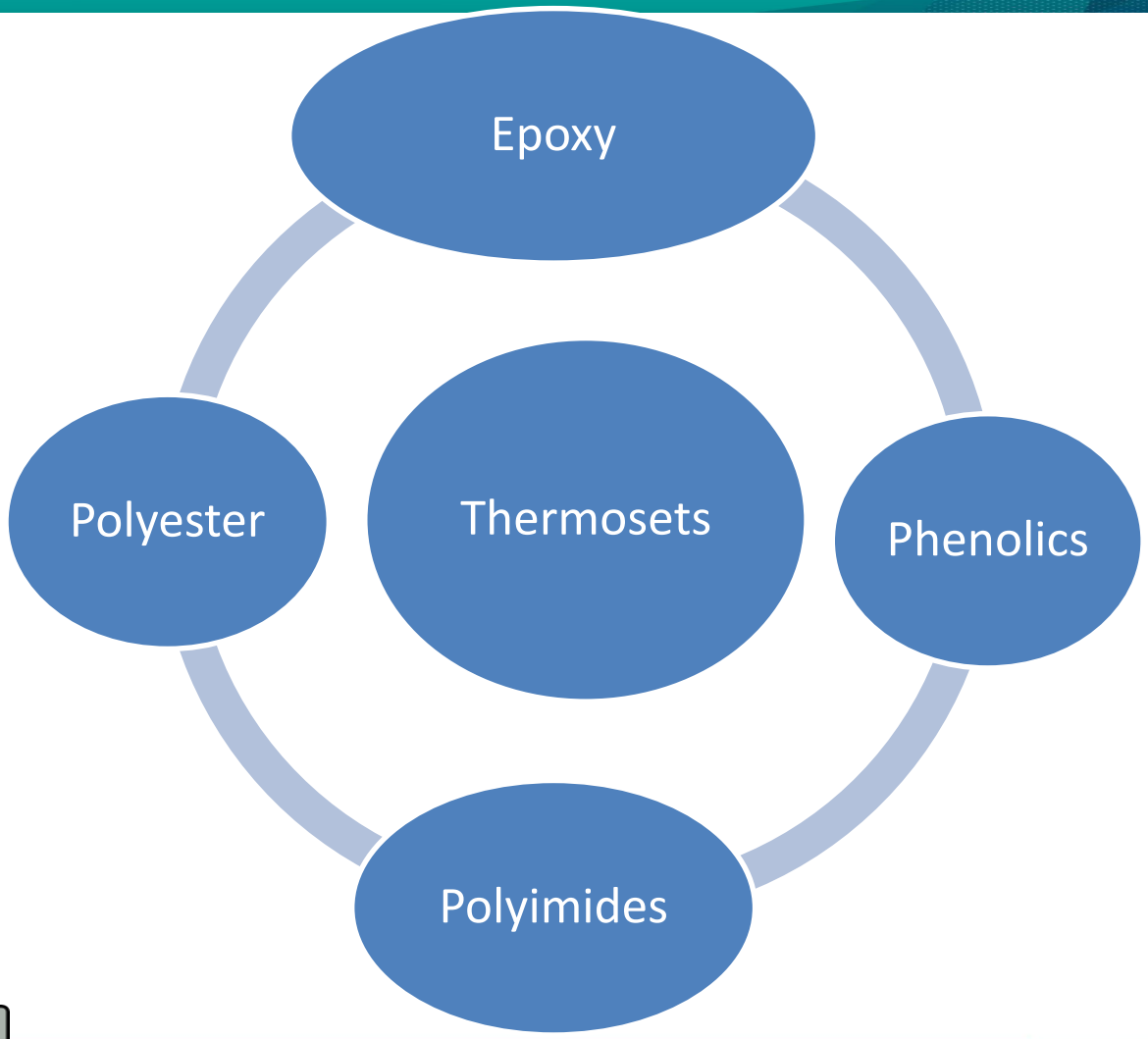
PROCESS OF THERMOPLASTICS



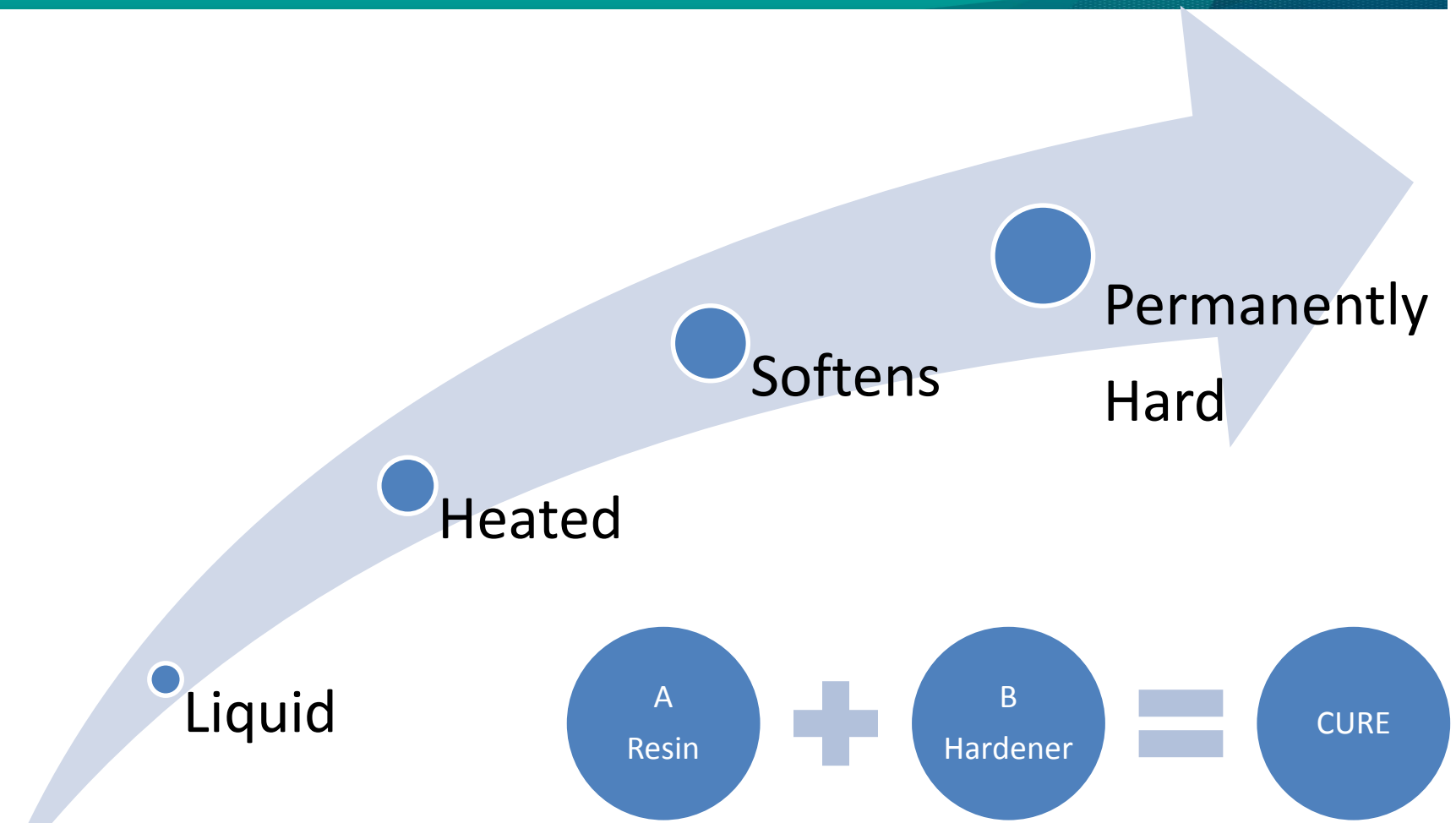
APPLICATION OF THERMOPLASTICS

PET	• Bottles • Packaging
LDPE	• Containers • Plastic bag
HDPE	• Toys • Pipe
PP	• Plastic chair • Household
PS	• CD case • Foam cup
PVC	• Pipe • Electronics equipment

Thermosets



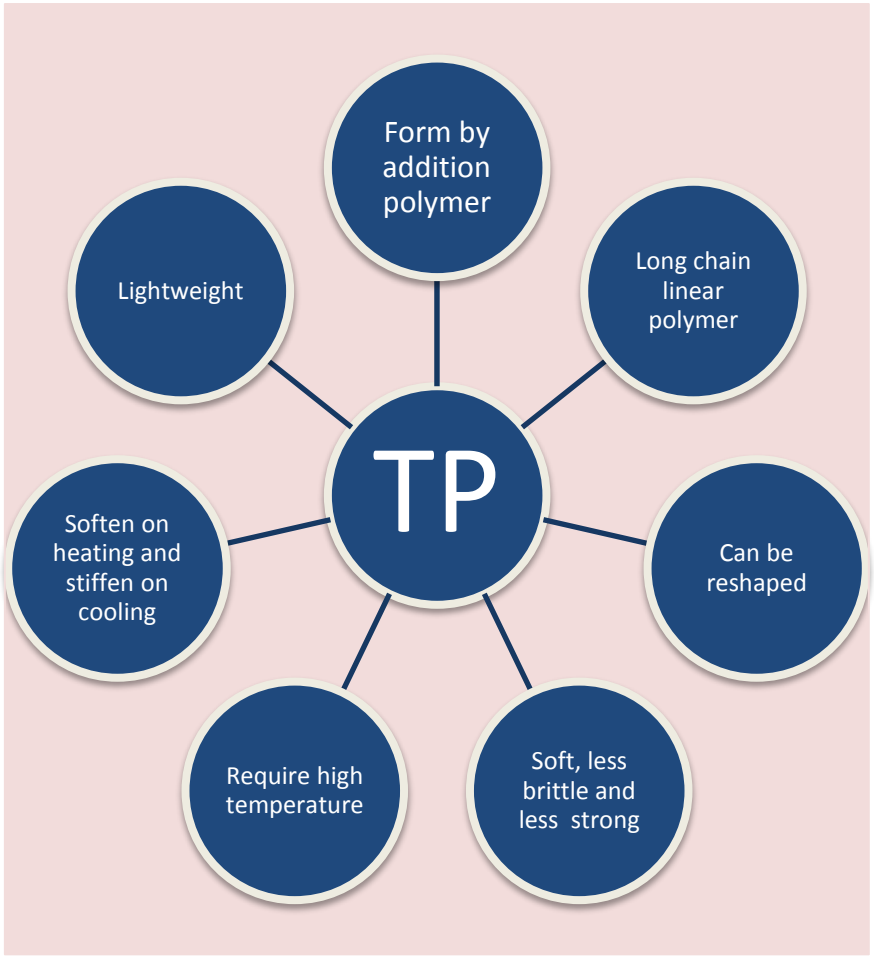
PROCESS OF THERMOSET

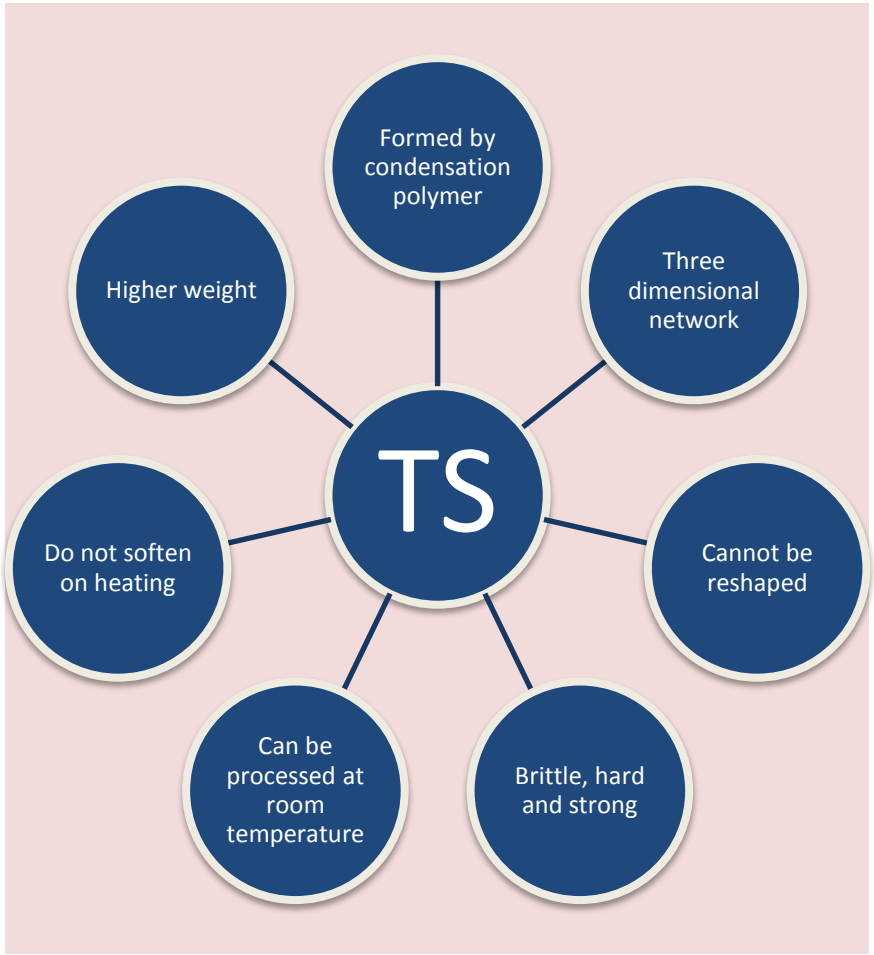


APPLICATION OF THERMOPLASTICS

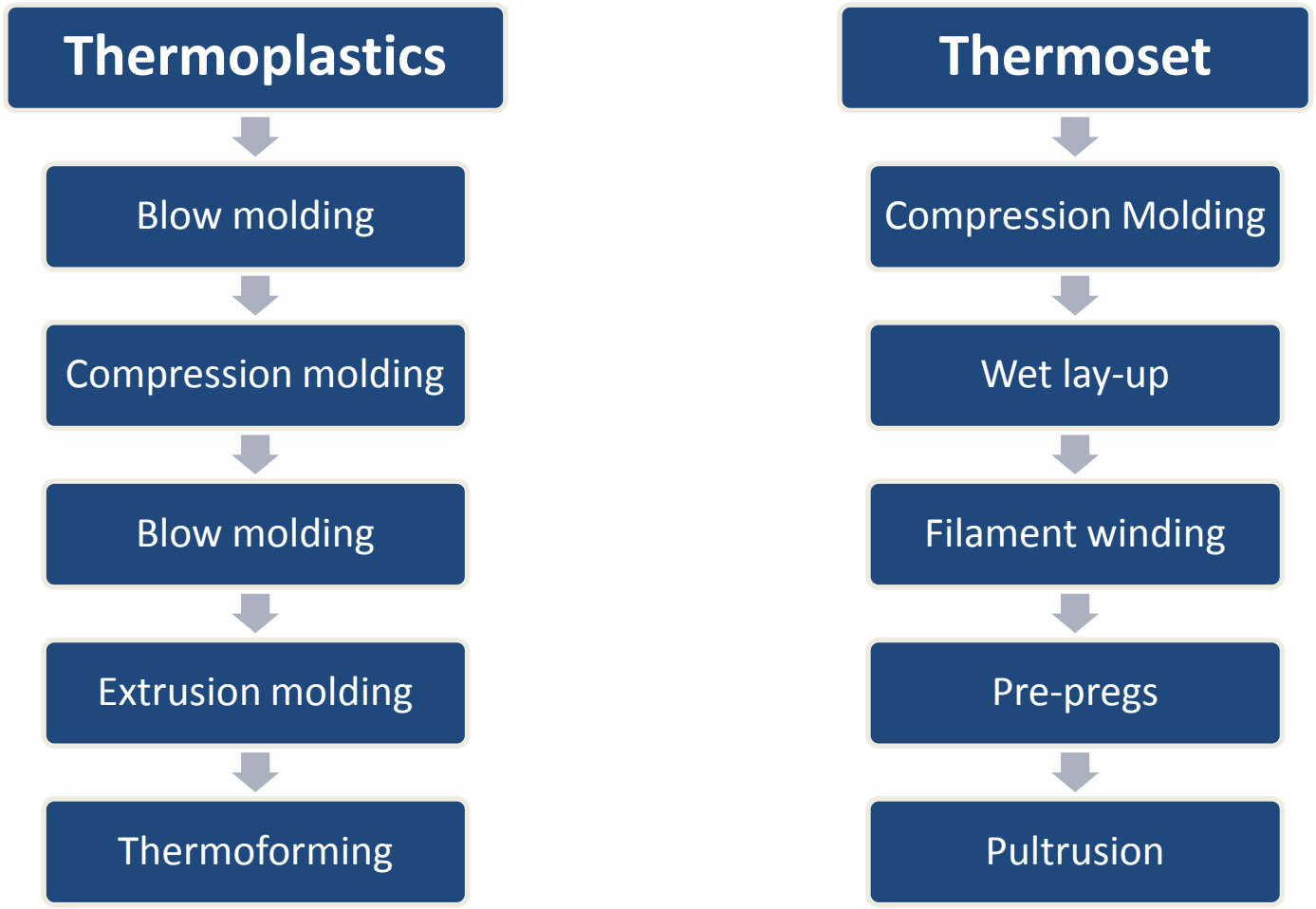
EPOXY	• Bottles • Packaging
POLYESTER	• Containers • Plastic bag
PHENOLIC	• Toys • Pipe
POLYIMIDE	• Plastic chair • Household

COMPARISON TP & TS





POLYMER PROCESSING



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Research Interest:

- ❑High Temperature Physical Chemistry
- ❑Thin Films Technology
- ❑Metals and Alloys.

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Research Interest:

- ❑Natural-fiber composites
- ❑Polymer based materials.

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