

- d. Which polymerization pathway is the most reliable for the synthesis of block copolymers of desired molar mass and composition?
2. Polycondensation of an equimolar mixture of adipic acid (1,6-hexanedioic acid) and hexamethylenediamine (hexan-1,6-diamine) is carried out at 200 °C until the conversion of 99 % is reached.
- a. Show the chemical reaction that describes the synthesis of this polymer. What polymer family does the product belong to?
- b. Calculate the number-average molar mass and the weight-average molar mass of the obtained polymer.

3. Poly(ethylene terephthalate) is a polyester that is most frequently used in the production of plastic bottles for carbonated drinks due to its high barrier properties for CO₂. This polymer can be synthesized via polycondensation reaction from terephthalic acid (TA) and ethylene glycol (EG) (ethan-1,2-diol). Consider that the reaction was carried out until the conversion reached 99 %.
- Show the chemical reaction that describes the synthesis of this polymer. What polymer family does the product belong to?
 - If there was 1 mol% excess of EG in the system, calculate the number-average molar mass of the obtained polymer.
 - If there was 2 mol% excess of EG in the system, calculate the number-average molar mass of the obtained polymer.
 - Comment on the difference between the values obtained in b) and c).

