

3. Polymer synthesis and viscosity measurement

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Date of report submission (yyyy/mm/dd):_____

Dates of experiment (yyyy/mm/dd) 1st day: _____; 2nd day: _____

Write concisely (in the space provided)

【Summary of Experiment】

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【Results】 (insert diagrams as needed)

1. Yield of nylon 6,10 (show the equation(s) used to calculate)

2. Polyacrylic acid synthesis by photopolymerization

For each polymer, note the curing time and hydrophilicity (“swelling”, “dissolves”, “no change” etc)

Monomer	Curing time (min)	Polymer hydrophilicity
Methyl methacrylate		
Ethyl methacrylate		
Hydroxyethyl methacrylate		

3. Intrinsic measurement of polyvinylpyrrolidone

Concentration	Liquid flow time (s)			
	1	2	3	Mean

From the data in the above table, calculate the specific viscosity, intrinsic viscosity, and average molecular weight. (Show the formulae.)

4. Reprecipitation, film formation, and electrical conductivity of poly(3-hexylthiophene)
Calculate the yield after reprecipitation (show the relevant formula(e))

sample	Resistance (Ω)	
	Without iodine doping	With iodine doping
poly(3-hexylthiophene)		

【Questions】

1. Synthesis of nylon 6,10
Show the reaction formula for interfacial polycondensation and describe how an interfacial polymerization occurs.
2. Photopolymerization for synthesis of polyacrylic acid
Show the reaction formulae of the photopolymerization.
Explain the reactivity of the acrylic acid monomers.
Explain the difference between step-growth polymerization and chain-growth polymerization.
3. Intrinsic viscosity measurement of polyvinylpyrrolidone
Compare the viscosity method with other methods for measuring molecular weight.
4. Reprecipitation of poly (3-hexylthiophene), film formation, conductivity
Explain the observed conductivities.