

SOP FOR LABORATORY PRACTICES

HEADING/SOP NUMBER: NNV #014	
Title of Procedure: Batch Protocol for NNV-BAM-Silica	Revision Date: 2013-04-17
Authors (Names):	
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SCOPE AND APPLICABILITY	
	Department, Lab or Center: BAM and Nanologica AB
	Research Group: 6.6 Polymeric materials ad surfaces and Nanologica AB
	Operation/Experiment: Batch Protocol
	Material(s): Silica dispersion in H₂O

Principal Materials Used	Flammable	Causes burns	Harmful by inhalation	Irritating to eyes and respiratory system	Harmful if swallowed	Highly flammable	Contact w. combustible mat. May cause fire	Grades and Suppliers
Lysine				x	x			Sigma-Aldrich
TEOS				x	x			Sigma-Aldrich
H2O MilliQ								
MSDS attached	x	Yes						
		No						

MATERIALS AND HAZARDS (CONT.)	
Special PPE Required:	
x	Goggles
x	Face Masks
	Chemical Resistant Apron

<input checked="" type="checkbox"/>	Protective Clothing
<input checked="" type="checkbox"/>	Gloves
	Butyl
<input checked="" type="checkbox"/>	Nitrile
	PVC
	Latex
	Neoprene
	Silver Shield brand
	Kevlar
	Other. Thermo resistant
	Respirator (If yes, contact EHS Office for additional assistance)

SPECIAL PRECAUTIONS	
	Permits: No.
	Mgmt. Approval: No
	Training: No
	Medical Surveillance: No
	Other: No
SPECIAL EMERGENCY PROCEDURES	
Fire/Evacuation:	Use a fire extinguisher and active the fire alarm
Chemical Spill:	Use plenty of water to wash it
Medical Emergency:	If chemicals contact with any part of the body, wash the affected zone with plenty of water.
Personal Exposure:	No concerns if production is carried out in well-ventilated area or inside fume hood.

EQUIPMENT AND INSTRUMENTAL BY STEPS		
Steps-Operation	Equipment/Glassware	Purchased from (suggestions)
Dissolution of lysine in H ₂ O	Round bottom flask Hot plate-Stirrer	Sigma-Aldrich Heidolph
Addition of TEOS	Hot plate-Stirrer Syringe needle	Heidolph Sigma-Aldrich

Filtration	Cellulose filter	Whatman
Dialysis	Dialysis membrane	Carl Roth GmbH

PROCEDURE			
All amounts refer to a batch synthesis in 51 ml of H ₂ O			
Task	Hazards	Precautions	Tolerance of Step
1. Dissolution of lysine in H ₂ O In RBF, weigh 0.124g of lysine monohydrate and dissolve it in 51 ml of H ₂ O. Stir it in oil bath at 60°C for 2 hours at 800 rpm. Keep RBF closed.	Acute effects in respiratory system and hands	Avoid inhalation Use gloves	Temperature: 60°C±2°C Stir Spd: 800±20rpm Time: 2±0.1h Weight: 0.124±0.001g Vol: 51±0.5ml
2. Addition of TEOS. With a syringe+ needle add 3.9ml of TEOS. Addition under same heating-stirring conditions. Stir for 72 hours.	Acute effects in respiratory system and hands	Avoid inhalation Use gloves	Temperature: 60°C±2°C Stir Spd: 800±20rpm Time: 72±5h Vol: 3.9±0.01ml
3. Filtration Filter the silica solution with a cellulose filter Whatman 0.2µm. Take the solution with the syringe and pass it very slowly through the filter. Replace the filter once the silica solution cannot pass through.	Acute effects in respiratory system and hands	Avoid inhalation Use gloves	
4. Dialysis Cut a portion of dialysis membrane and place it in water for 5 minutes. Close one of the edges of the wet portion and pass some air through. Add the filtered silica solution to the membrane and close the open edge. Introduce the filled membrane in to a beaker with water and stir the system for 5 days.	Acute effects hands	Use gloves	Time: 5±1min 5±0.5 days