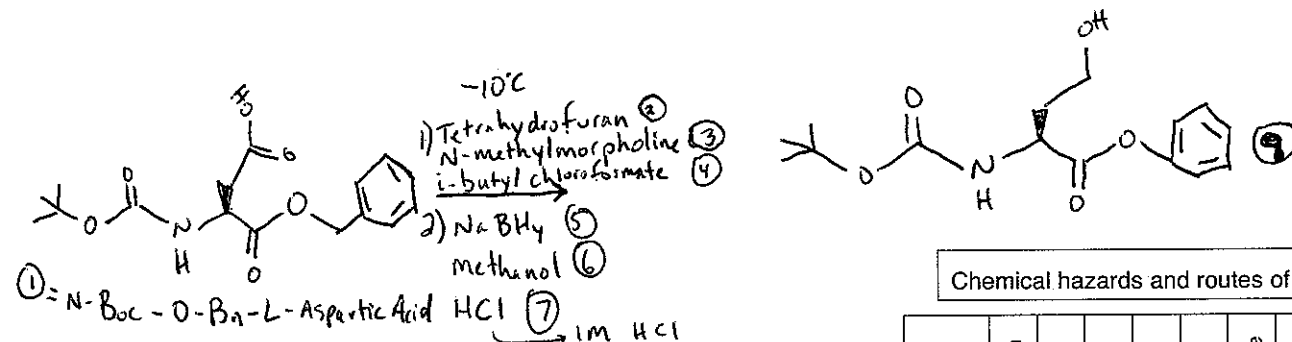


# Reaction Risk Assessment Form.

Reaction number: AA001MRH

Write your reaction here including work-up and purification method (e.g. chromatography). Use the form below to risk assess ALL associated reaction and process conditions (e.g. heating, cooling, vacuum), particular hazards (e.g., exotherm, gas evolution, flooding, asphyxiation, burns - hot or cold, explosion), quench procedures, and waste disposal as well as the chemicals to be used, including your expected product, solvents, and known byproducts.



- Notes
- 1) Causes precipitation of a white solid
  - 2) Considerable amounts of gas are evolved during methanol addition. Add slowly + be sure to vent
  - 3) HCl quenching is highly exothermic
  - 4) Extract with Ethyl Acetate (8)

## Chemical hazards and routes of exposure

Route of exposure: 1 Inhalation; 2. Skin/eye contact; 3 Swallowing	Carcinogen, teratogen, mutagen	Very toxic / toxic ORAL	Harmful/Irritant Dermal	Explosive	Pyrophoric	Highly flammable, flammable	Oxidising	Corrosive	Lachrymator	Other (specify):
①	-	-	-	-	-	-	-	-	-	-
②	-	4	3	2	-	2	-	2	X	-
③	-	4	4	2	-	2	-	2	X	-
④	-	4	1B	2	-	3	-	3	X	-
⑤	-	3	3	3	2	3	-	1B	-	-
⑥	-	3	2	2	-	2	-	-	-	-
⑦	-	3	1B	-	-	-	-	1B	X	-
⑧	-	5	2A	2	-	2	-	-	-	-

Repeat experiment (this book only - please circle one) (No) / Yes (previous assessment on page: )

New experiment (Please tick one):

Category:

A

B

C

D

Standard protocol followed? (Please give reference) Nature Protocols 5 (12), 2010, 1967

Reaction conditions and associated processes (heat, cooling, pressure, vacuum etc) and hazards:  
(Refer to general risk assessments on Departmental safety website)

Keep reaction at -10°C (between -8 + -15°C)  
Keep reaction vented through Schlenk line

Control Measures:  
(please tick boxes)

Safety glasses: ☒

Lab coat: ☒

Fume hood: ☒

Safety screen:

Gloves (type):

Nitrile

Marigolds:

Other:

Scrubbing train (type):

Other:

Are specific emergency procedures necessary for this process: Yes/No. If Yes, give details:

Reaction and/or reagent quench: Quench with HCl produces heat  
(Give quench type and possible hazard)

Waste disposal: Chlorinated Waste  
(circle as appropriate)

Hydrocarbon Waste

Silica Waste

Other (specify):

Aqueous waste

Co-worker signature:

Designated Supervisor Signature:

Keith Hey

Date:

Date: 5/16/2012

PROCEDURE IDENTIFICATION:

RISK ASSESSMENT TOOL for LABORATORY PROCEDURES

AA001MRH

List chemicals used. Attach MSDS and any written procedures.

Chemical Volume(s)	Micro <0.5 L	1	0.5	2	Normal 3	2 L	4	Large > 2 L	5
Hazard Recognition	None				Routine			Extreme	
USE HIGHEST SCORE ONLY	Flammable Corrosive Toxic Cryogenic	0 0 0 0			1 1 1 1	2 2 2 2	3 3 3 3	4 4 4 4	5 5 5 5
Process Conditions	N/A		Sub-ambient (P < 1 atm; T < 10°C)			Ambient (P = 1 atm; T > 10 & < 40°C)		Extreme	
	0		3		1	2		3	5
Explosive Hazard	No				Yes				
	0				5				
Radiation Hazard		Minimal			Normal			High	
	0	1	2	3	4			5	
Other Hazard: Specify & Score		Minimal			Normal			High	
	0	1	2	3	4			5	
Special Hazards:	Inhalation Toxicity 0				Reactive			0	5
									5
Procedure	Detailed & Written				Routine			Under Development	
	0				1	2	3	4	5
Personnel Preparedness & Training	Fully Trained & Prepared				Routine			Untrained	
	0				2			4	5
Ventilation Needed	Hood Used				General Lab Only			Not Used	
	0				3			4	5
Shielding Needed	Used							Not Used	
	0							5	
Equipment Maintenance	Regularly Performed & Documented							Never Performed	
	0				1	2	3	4	5

Initial Score: \_\_\_\_\_

RECOMMENDED ACTIONS BASED ON SCORE		
LOW	< 15	Procedure can be performed with routine precautions.
MODERATE	15 - 25	Procedure can be performed with attention given to specific hazards. Supervision is recommended.
HIGH	26 - 30	Procedure may be performed if necessary. High level attention must be given to all hazards. High level, continuous supervision is mandatory.
EXTREME	> 30	Procedure must be revised to lower the risk.

If score is > 25, risk reduction actions should be identified and implemented.

INSTRUCTIONS

Complete the LABRAT as part of the procedure review. Scoring is based on a 0 - 5 scale, with 0 being "NOT APPLICABLE" and 5 being "Extreme" Your can assign any score to a specific box applicable, even if the score vale is not shown on the RAT. After scoring, interpret the score using the guidelines in the top of the right column. The IC can increase or decrease the assessment, based on the situation.

List Chemicals Used

Chemical	Volume or Weight