6/14/07

UCSC
MOCVD LAB MTG. W/ CFM

JACK E, RANDY P, DEAN R, BOB VITALE.
CFM - CHUCK HERNANDEZ.

PER CONTROL
- 1-GAL PYROPHORIC LIQUID - CBC 3D.1 / SFM
- 200 Gm PYROPHORIC SOLID - CBC 3D.1 / SFM

1 GAL = 3.78L x 1000 = 3,780 ml / B-OCCUPANCY
3780 ÷ 5 ≃ 756

LARGEST CANISTER ≃ 750 ml

MAXIMUM QT. = 5 - EACH.

* NOBBY'S PLAN - ON MOCVD TOOL & ONE ALD TOOL

* CONTROL AREAS
PROJECTS - ALT - 2 & 3 - ~~SEPARATE~~ ONE COMMON CONTROL AREAS
- CLEANROOM - " " AREA.
- REMAINDER OF BLDG ONE CONTROL AREA
- OTHER AREAS ARE NOT DEFINED AND NOT ACKNOWLEDGED BY CFM.

* I.D. A.(N) CONTROL AREA OR H-OCCUPANCY FOR MOCVD LAB

OPTIONS 1. * NEXT TO (E) CLEANROOM
2. * 3RD LEVEL (N) CONTROL AREA

* ROOM 210 OPTION IS RULED OUT

CHEMICAL LIST: 1) RECEIVED CHEM LIST FOR MOCVD TOOL
B 2) STILL NEED CHEM LIST FOR ALD TOOL

HCSC
ACTION ITEMS

6/14/07

1. ALD CHEM LIST — NOBBY
2. EVALUATE TWO OPTIONS • (E) CLNRM & A 2ND. AREA ON LEVEL-3 — IES/GLP.
3. PROVIDE EQUIPMENT CUT SHEETS SHOWING DIMENSIONS & WEIGHTS — NOBBY
4. I.D. PROTECT AREAS W/ 1-HR WALLS — IES/GLP
5. I.D. EXIT CORRIDORS (FIRE RATED) — IES/GLP
6. I.D. CHEM CANISTERS' SIZE AVAILABLE — IES/GLP
7. PROVIDE PROCESS FLOW LOGIC W/ GAS FLOW RATES — NOBBY
8. DEFINE <u>H2</u> CONSUMPTION PER WEEK, MONTH, ETC TO SIZE DELIVERY SYSTEM & GAS CYLINDERS REPLACEMENT FREQUENCY — NOBBY
9. EMERGENCY GENERATOR CURRENT CAPACITY & LOADING — BOB

Chemicals to be Used in Advanced Materials Syntehsis Processes at Baskin Engineering Building
(Nobby P. Kobayashi, 06/13/2007)

	Symbolic chemical name	Generic chemical name	Chemical formula	State under the standard states (at 1atm / 25°C)	Container to be installed at a reactor	Total amount of material to be present per reactor (g)	Click for MSDS	Summary of physical properties	Remarks
1	TMAl	trimethylaluminum	$Al(CH_3)_3$	liquid	Stainless steel vacuum tight container	200 x0.79 =253		Pyrophoric	Aluminum source for III-V compound semiconductors such as AlAs, AlGaP
2	TMGa	trimethylgallium	$Ga(CH_3)_3$	liquid	Stainless steel vacuum tight container	200 x1.1 =182		Pyrophoric	Gallium source for III-V compound semiconductors such as GaAs, InGaAs
3	TMIn	trimethylindium	$In(CH_3)_3$	solid	Stainless steel vacuum tight container	200		Pyrophoric	Indium source for III-V compound semiconductors such as GaAs, InGaAs
4	TBAs	tertiarybutylarsine	$As(C_4H_9)H_2$	liquid	Stainless steel vacuum tight container	400 x1.35 =296		Toxic, pyrophoric	Arsenic source for III-V compound semiconductors such as GaAs, InGaAs
5	TBP	tertiarybutylphosphine	$P(C_4H_9)H_2$	liquid	Stainless steel vacuum tight container	400 x0.79 =506		Flammable	Phosphorus source for III-V compound semiconductors such as GaAs, InGaAs
6	DEZn	diethylzinc	$Zn(C_3H_5)_2$	liquid	Stainless steel vacuum tight container	100 x1.192 =85 1322ml		Pyrophoric	Acceptor source for III-V compound semiconductors
7	Si_2H_6	disilane	Si_2H_6	gas	Standard gas cylinder	a lecture bottle		Flammable	Donor source for III-V compound semiconductors, 100ppm diluted in hydrogen
8	H_2	hydrogen	H_2	gas	Standard gas cylinder	~9 x 50" standard cylinders with ~2000psi		Flammable	Ultra high purity hydrogen will be generated from high purity hydrogen
9	N_2	nitrogen	N_2	gas	Standard gas cylinder	~9 x 50" standard cylinders with ~2000psi	n/a	n/a	Ultra high purity supplied by Baskin Engineering building
10	DMATi	Tetrakis(dimethylamino)titanium	[(CH3)2N]4Ti	liquid	Stainless steel vacuum tight container	200		air sensitive	Titanium sorce for mixed oxide such as TiO2 for ultra-high density solid-state memory
11	CpEr	Tris(cyclopentadienyl)erbium	Er(C5H5)3	solid	Stainless steel vacuum tight container	200		Flammable	Er source for ErSb used for thermoelectric devices
12	TMSb	Trimethylantimonide	Sb(CH3)3	liquid	Stainless steel vacuum tight container	200		Flammable	Sb source for ErSb and InSb used for thermoelectric devices

Rizik

From: Bob Vitale [rvitale@soe.ucsc.edu]
Sent: Wednesday, June 13, 2007 5:24 PM
To: Rizik
Cc: marting@GLPsf.com; dricker@ucsc.edu; jack@GLPsf.com; Randy Porter; Nobby Kobayashi; Steve Paul
Subject: UCSC MOCVD System - Revised Chemical List

06132007_chemical list for MOC...

All,

Attached is an updated projected chemical inventory from Prof Kobayashi for that lab. He listed all chemicals at levels he would like to optimally have. He is willing to discuss alternatives as needed.

Changes I see from the 5/14/07 copy are as follows:
-increase quantities from 100g to 200grams for
#1 - trimethylaluminum
#2 - trimethylgallium
#3 - trimethylindium

-increase quantities from 100g to 400grams for
#4 - tertiarybutylarsine
#5 - tertiarybutylphosphine

6-9 appear unchanged

-additions of the following (200g quantities)
#10 - Tetrakis(dimethylamino)titanium
#11 - Tris(cyclopentadienyl)erbium
#12 - Trimethylantimonide

Let me know if you think Prof Kobayashi should be at the FM meeting tomorrow. He has another appointment but if we think it necessary he will cancel his other meeting.

regards, Bob

--
Robert L. Vitale, PE
Laboratory Director
Jack Baskin School of Engineering
Mail Stop SOE2
1156 High Street
Santa Cruz, CA. 95064
Voice: (831) 459-3794
Fax: (831) 459-4046
email: rvitale@soe.ucsc.edu