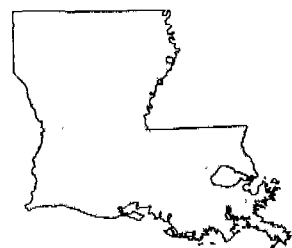


REACTIVE CHEMICAL REVIEW 1991, 1993, 1994

Process Risk Management

Poly C

Dow Chemical, Louisiana Operations



DO A 017854
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Physical Characteristics of Hydrogen

Flammability Limits: 4% - 75% by volume
Detonation Range: 20% - 60% by volume
Heat of Combustion: 51,600 Btu/lbm
Flame Temperature: 2050 Deg C (3722 F)
Spontaneous Ignition: 1150 PSIG ---> atmosphere
Auto-ignition Temperature: 571 Deg C (1060 F)

NFPA Hazard Classification

Health Hazard (blue).....0 (None)
Flammability (red).....4 (Rapidly vaporize/burn)
Reactivity.....0 (None)

Equipment Design Specifications

Material of Construction	- Carbon Steel
Design Pressure	- 700 PSIG
Design Temperature	- 260 DEG C
Piping Specification "N"	- 700 PSIG @ 500 Deg F (600 PSIG RTJ flanges)

Procedures

New:

Pre-Startup Procedures, Filename: H2-P2
Pre and Post-Startup Purging Instructions, H2-P3
Startup Procedures, H2-P4
Hydrogen Fire at the Hydrogen Drying Skid, EMERG-P19
Trouble Shooting Chart, H2-TS1

Modified:

Swinging Hamer Blinds, Filename: SAFE-P2
Mixing Calcium Stearate With Bags, CAST-P2
Calcium Stearate Mix Procedure, CAST-P3
Red Tagging D-401/D-402 PSV Removal, CAST-RT1
Charging Absorption Beds, EQUIP-P3

Reactive Chemicals

Reactivity with common materials:

1. No chemical reaction, but low temperature causes most materials to become brittle.
2. No known reactions between hydrogen and molecular sieve.
3. Degradation temperature of molecular sieve: 425 - 540 C
4. Theoretical temperature rise upon initial adsorption is 4 - 6 Deg C.
5. Hydrogen embrittlement of carbon steel at temperatures greater than 260 Deg C.

Positive Identification of the Hydrogen:

1. Dedicated system at Air Products, wet or dry.
2. On-line Air Products analyzer with 99.5 mole % Hydrogen trip.
3. Nitrogen purge capability is a potential contamination source. However, double block and bleed arrangement is employed as well as adequate procedures.

Environmental

Hydrogen Composition:

H2	99.0% (MIN)
O2	10 PPMV (MAX)
N2/CH4/AR	5000 PPMV (MAX)
CL2/ORGANIC CHLORIDES	1 PPMV (MAX)
CO/CO2	10 PPMV (MAX)
H2O	100 Deg F dewpoint

Regeneration Method:	Closed Loop, Split Stream. No losses to atmosphere.
Sources of Discharge:	Pressure Relief Valves Condensate from YD-101, Knockout Pot
Potential Waste Generation:	Spent mole sieve, Type 4A. (Plans are to reclaim)

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