

Monsanto

FROM (LOCATION) St. Louis 77, Missouri

CC

DATE May 21, 1965

SUBJECT Toxicity and Hazards & Physical Constants Data

REFERENCE

TO Mr. E. Wheeler
General Offices

Attached is section on Toxicity and Hazards and Physical Constants Data for Tentative Process P-1367, entitled "Production of Ethylene/Vinyl Chloride Copolymer for Pigment Binder", by M.E. Gibbs & J.H. Brown, dated February 25, 1965, Job No. 4575.

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RSV 0008891

8. Tensile Properties

The dry polymer is stabilized with 0.5-pound Advastab CH300 and 0.1% Santowhite powder, mill rolled, and molded into 0.060-inch thick sheets. Tensile specimens are cut and measured on an Instron tester at 5 inches per minute crosshead speed according to ASTM test D412-51T.

9. Mechanical Stability

This test subjects a 40.0 g., filtered sample of E/VCl copolymer latex suspension to a shearing force exerted by a 1-inch metal disc under a load of 6 kg., rotating at 1000 rpm., in contact with a polyethylene surface. The sample container temperature is held constant at 35°C. by circulating water through the jacket. The test is timed for 20 minutes. Following this, the sample is filtered through a 200 mesh screen. About 300 ml. of water is used in transferring the sample and washing the coagulum retained on the filter. The coagulum formed is dried on the screen at 95-100°C. for at least 30 minutes. The weight of coagulum is a measure of sample stability.

TOXICITY AND HAZARDS

A. Vinyl Chloride

Vinyl chloride is a flammable liquid and a dangerous fire hazard. Its vapors form flammable mixtures with air at all temperatures down to 20°F. The limits of inflammability are 4-22% by volume in air. 10% vinyl chloride is dangerous to life of animals in from 30-60 minutes of exposure, whereas 5% causes symptoms in less than an hour. Vinyl chloride is stored in a cool, ventilated area away from open flame, acute fire hazards or powerful oxidizing agents. Personnel exposed to it should heed the warning of dizziness and disorientation, and remove themselves at once from air contaminated with it.⁽⁵⁾

B. Ethylene

No appreciable reaction occurs in ethylene at 2000 atmospheres below 100°C. and in ethylene at 250°C. below about 500 atmospheres. Nevertheless, even under

these conditions, an uncontrollable reaction will propagate if by some mischance it is initiated. Ethylene is only safe from such propagations inside limiting conditions of which the following are examples:

Pressure	1000 atm.	400 atm.	200 atm.
Temperature	20°C.	100°C.	210°C.

The flammability limits of ethylene with oxygen are 2.9-79.9% by volume and with air are 2.75-28.6% by volume.⁽⁴⁾

C. Ammonium Persulfate

Contact of ammonium persulfate with other material may cause fire or explosion.

POLLUTION CONTROL

The off-gas from the reaction may be recycled to subsequent batches or is flared to eliminate atmospheric pollution and an explosion hazard. Because of the relatively high density of vinyl chloride gas, high concentrations can accumulate near an atmospheric vent without a flare.

REFERENCES

1. Bovey, F. A., I. M. Kotthoff, A. I. Medalia, and E. J. Meehan, Emulsion Polymerization, Interscience Publishers, Inc., New York (1955).
2. Deex, O. S., Progress Report, Central Research Department, September 1964, E/VCl Synthesis, Characterization and Applications, Job No. 2602, Issue 8.
3. Deex, O. S., Progress Report, Central Research Department, December 1964, E/VCl Synthesis and Applications, Job No. 2602, Issue 5b.
4. Renfrew, A., and P. Morgan, Polythene, The Technology and Uses of Polymers, Interscience Publishers, Inc., New York (1957).
5. Sax, N. Irving, Handbook of Dangerous Materials, Reinhold Publishing Corporation, New York (1951).