

UN/SCETDG/21/INF.8

COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS AND ON THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS

Sub-Committee of Experts on the

Transport of Dangerous Goods

(Twenty-first session, 1-10 July 2002,
agenda item 8 (c))

LISTING AND CLASSIFICATION

Miscellaneous amendment proposals (Parts 2 and 3)

Comment to the German proposal (ST/SG/AC.10/C.3/2002/5)

Transmitted by the Expert from Japan

1. Introduction

The German proposal (ST/SG/AC.10/C.3/2002/5) on amendments for calcium hypochlorite entries which has been submitted to the last session of the Sub-committee as information paper (UN/SCETDG/20/INF.26). For the proposal, we also evaluate and consider the hazard potential of calcium hypochlorite in question. As a result of our evaluation, the Expert from Japan sympathizes with the proposal submitted by Germany in principle. However, we have a different opinion concerning calcium hypochlorite hydrated with higher moisture content.

2. Justification

Expert from Germany carried out the heat accumulation storage tests for determination of the SADT on various calcium hypochlorite samples according to the definition in the UN recommendations on the Manual of Tests and Criteria, section 28.4.4.

On the other hand, our heat storage tests for that were almost similar to the definitions in Manual of Tests and Criteria, section 28.4.1. Our test results are shown in ANNEX.

From the results, regarding SADT, a part of that was different from Germany tests but the most part of that was almost similar. However, regarding maximum temperature and time to exothermic decomposition, these showed different results.

When calcium hypochlorite hydrated with more than 10% water decomposed, the maximum temperature of that was about 150 degrees. On the other hand, when calcium hypochlorite hydrated with more than 5% water, less than 10% water decomposed, the maximum temperature of that was more than 200 degrees. In addition, when calcium hypochlorite hydrated with less than 5% water decomposed, it arrived more than 300 degrees. And also, the difference between types was remarkably seen in time to exothermic decomposition. These results shows that water content is not much related to SADT, but water contents has much effect on maximum temperature and time to exothermic decomposition.

In addition, the decomposition of calcium hypochlorite hydrated with less than 5% water may cause inflammables to ignite. In the past, it caused terrible accidents such as fire and explosion. On the other hand, calcium hypochlorite hydrated with more than 10% water does not reach the level to ignite inflammables and it has never caused any sorts of accidents. From a safety perspective, these facts show that the types of calcium hypochlorite have different property.

From the above results, we think that the transport requirements for Calcium Hypochlorite should be established based on maximum temperature and time to exothermic decomposition rather than SADT.

We believe that only Calcium Hypochlorite with less than 10% water needs to be transported under temperature control.

3. Proposals

"PPXX" in para.3.b) in ST/SG/AC.10/C.3/2002/5 should read as follows:

"PPXX For UN1748, UN2208 and UN2880 bags are not allowed. Quantities shall not increase 200kg net mass per package. Transport under temperature control only; for Calcium Hypochlorite, with less than 10% water, for packaging up to 100 kg net mass control temperature of 45 degrees and for packaging up to 200kg net mass 35 degrees"

ANNEX

Heat accumulation tests

1. Testing method

The heat accumulation tests for determination of the SADT, maximum temperature and time to exothermic decomposition on various Calcium Hypochlorite samples were carried out. These tests were almost similar to the definitions in the UN recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, section 28.4.1.

45kg, 50kg plastic drum, 50kg steel drum and 136kg, 150kg fiber drum were used. All packages were filled with same amount of substance. All packages were heated in the constant temperature room for a long period of time (maximum 3 weeks). The temperature in the center of drum was researched successively. Table shows the relation of water content, SADT, time to exothermic decomposition and maximum temperature of product when decomposition occurs.

Table. Result of heat accumulation test

Water	SADT (degrees)	Time to exothermic decomposition	Maximum temperature in the center of drum (degrees)	Remarks
1~3 %	77~80	20~30 hours	>300	50kg steel drum
7.5%	60	60 hours	>200	150kg fiber drum
9.0%	55	195 hours		
11.5%	60	50 hours	142	136kg fiber drum
12.0%	55	290 hours	150	50kg plastic drum
12.0%	52	225 hours		50kg steel drum
12.0%	50	294 hours		45kg plastic drum
12.0%	48	517 hours	148	136kg fiber drum
14.8%	50	528 hours	130	50kg steel drum

2. Test results

- (a) As the water content in calcium hypochlorite increases, the maximum temperature at the center of a drum decreases. This is because the amount of decomposition heats decreases. Also, as water content increases, SADT temperatures fall. However, the time to exothermic decomposition is much greater.
- (b) The decomposition reaction of high hydrated calcium hypochlorite is quite mild. The maximum temperature in the center of a drum is fairly moderate (below 150 degrees); under such conditions inflammables are not ignited or melted. On the other hand, the decomposition reaction of low hydrated calcium hypochlorite can be violent. The decomposition reaction of dry calcium hypochlorite is quite violent. Such reaction of decomposition causes inflammables to ignite and may result in an explosion.