



## 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

#### Sixty-fourth session

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Item 3 of the provisional agenda

#### Listing, classification and packing

### Classification of butyl acrylates, stabilized

Submitted by the expert from China\*

#### I. Introduction

1. Butyl acrylates are a group of chemicals which are flammable and tend to polymerize without stabilization, including four substances: n-butyl acrylate, sec-butyl acrylate, tert-butyl acrylate and isobutyl acrylate (figure 1).

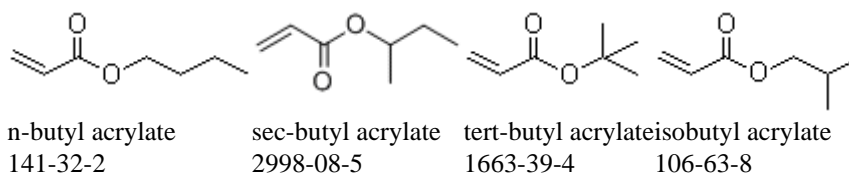


Figure 1: Four butyl acrylates

2. According to the literature, the flash points of the four substances (stabilized) are as listed below:

Substance	Flash point	Data Source
n-butyl acrylate	37 °C	European Chemicals Agency (ECHA)
sec-butyl acrylate	34.5 °C	ChemBK
tert-butyl acrylate	14 °C	ECHA
isobutyl acrylate	30 °C	ECHA

\* A/78/6 (Sect. 20), table 20.5.



3. In the *Model Regulations* there are two entries for butyl acrylates, UN 2348 and UN 2527:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
2348	BUTYL ACRYLATES, STABILIZED	3		III	386	5L	E1	P001 IBC03 LP01		T2	TP1
2527	ISOBUTYL ACRYLATE, STABILIZED	3		III	386	5L	E1	P001 IBC03 LP01		T2	TP1

4. China has identified two issues:

- Firstly, the two entries are both assigned to Class 3 and packing group III, with exactly the same transport requirements, in not only the *Model Regulations*, but also the ICAO Technical Instructions for the Safe Transport of Dangerous Goods By Air, the IMO International Maritime Dangerous Goods (IMDG) Code and ADR, RID and ADN. It seems confusing that ISOBUTYL ACRYLATE, STABILIZED is listed as a separate entry.
- Secondly, bearing in mind the flash point below 23 °C, China believes that classification in Class 3 and packing group III does not describe the hazard characteristics of tert-butyl acrylate accurately. Classification in packing group II seems necessary.

5. The expert from China thus proposes the following amendments to the *Model Regulations*.

## II. Proposal 1

6. Delete in 3.2 the current entry for UN 2527 from the dangerous goods list (deleted text appears as strikethrough):

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
<del>2527</del>	<del>ISOBUTYL ACRYLATE, STABILIZED</del>	<del>3</del>		<del>III</del>	<del>386</del>	<del>5L</del>	<del>E1</del>	<del>P001 IBC03 LP01</del>		<del>T2</del>	<del>TP1</del>

7. Amend the entry for isobutyl acrylate, stabilized in the alphabetical index as shown (deleted text appears as strikethrough and new text in **bold underlined**):

~~ISOBUTYL ACRYLATE, STABILIZED~~ **Isobutyl** 3 ~~2527~~  
**acrylate, stabilized, see** **2348**

## III. Proposal 2

8. Insert in 3.2 a new row for UN 2348, packing group II in the dangerous goods list as shown (deleted text appears as strikethrough and new text in **bold underlined**):

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
<del>2348</del>	<del>BUTYL ACRYLATES, STABILIZED</del>	<del>3</del>		<del>III</del>	<del>386</del>	<del>5L</del>	<del>E1</del>	<del>P001 IBC03 LP01</del>		<del>T2</del>	<del>TP1</del>
<b><u>2348</u></b>	<b><u>BUTYL ACRYLATES, STABILIZED</u></b>	<b><u>3</u></b>		<b><u>II</u></b>	<b><u>386</u></b>	<b><u>1L</u></b>	<b><u>E2</u></b>	<b><u>P001 IBC02</u></b>		<b><u>T4</u></b>	<b><u>TP1</u></b>

## IV. Justification

9. This is a Class 3, flammable liquid, packing group II entry without any subsidiary hazard, for which the explosive hazard has been neutralized by stabilization. In accordance with the guiding principles, a limited quantity of “1L”, exempted quantity code “E2” and

packing instructions “P001” and “IBC02” apply. As for portable tank provisions, there are two options to choose from, “T4” and “T7”. Since this is not a “not otherwise specified” (n.o.s.) entry and given that “T2” instead of “T4” is chosen for the packing group III entry under the same UN number, China considers that “T4” should be the more appropriate choice. “TP1” has been assigned, bearing in mind that the vapour pressure of tert-butyl acrylate at 65 °C is between 10 and 20 kPa (ECHA<sup>1</sup>).

## V. Further considerations

10. The expert from China would also like to invite the Sub-Committee to consider how stabilized tert-butyl acrylate, stabilized, should be classified under the current *Model Regulations*:

- (a) Can it be regarded as a substance listed by name in the dangerous goods list, to be transported under UN 2348 in accordance with 2.0.2.2 of the *Model Regulations*, even if the listed packing group is not appropriate according to the criteria in 2.3.2.6 ?

*“The substances listed by name in column (2) of the Dangerous Goods List of chapter 3.2 shall be transported according to their classification list or under the conditions specified in 2.0.0.2.”.*

- (b) Or, should UN 2348 be understood as a generic entry for a well-defined group of substances (i.e. type (b) in 2.0.2.2), so that the classification of tert-butyl acrylate, stabilized, should follow the instructions in 2.0.2.8 ? But in this case, which entry is the most suitable for tert-butyl acrylate, stabilized ? Should it be assigned to a generic entry with the word STABILIZED added as part of the proper shipping name (see for instance, UN 3271, ETHERS, N.O.S., STABILIZED, PG II), as indicated in 3.1.2.6 ?

11. Although the specific problem of the classification of tert-butyl acrylate raised in this document can be solved by simply adding a packing group II entry to UN 2348, the expert from China would like to remind the Sub-Committee that this is not the only substance in this kind of dilemma. There might be a more systematic problem behind and, thus, a more systematic solution should be found. China would like to invite the Sub-Committee to consider the questions above as a starting point for the discussion.

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<sup>1</sup> See [European Chemical Agency](#), the vapour press of tert-butyl acrylate is 100 hPa at 55.05 °C and 200 hPa at 71.52 °C.