Application of data when the available range data spans more than one acute toxicity range estimate in Table 3.1.2

Ingredient information:

Ingredient	Wt%	Test Data
Ingredient 1	16	LD_{50}: 1,600 mg/kg
Ingredient 2	4	Acute toxicity range estimate: $200 < LD_{50} < 2{,}000$
Ingredient 3	80	LD_{50}: 3,450 mg/kg

Answer:

Apply the equation in paragraph 3.1.3.6.1:

$$\frac{100}{ATE_{mixture}} = \sum_{n} \frac{Ci}{ATEi}$$

$$\frac{100}{ATE_{mixture}} = \frac{16}{1{,}600} + \frac{4}{200} + \frac{80}{3{,}450}$$

Therefore: $ATE_{mixture}$ = 1,880 mg/kg, Category 4

Rationale:

(a) Classification via application of substance criteria is not possible since acute toxicity test data was not provided for the mixture (paragraph 3.1.3.4);

(b) Classification via the application of bridging principles is not possible since data on a similar mixture was not provided (paragraph 3.1.3.5.1);

(c) Classification of the mixture based on ingredient data can be considered (paragraph 3.1.3.6);

(d) Applying the "relevant ingredients" concept from paragraph 3.1.3.3(a) means that all ingredients will be considered when applying criteria in paragraph 3.1.3.6;

(e) Data is available for all ingredients so criteria in paragraph 3.1.3.6.1 apply;

(f) Ingredients 1, 2 and 3 are all included in the $ATE_{mixture}$ calculation because they have data that fall within a GHS acute toxicity category [paragraph 3.1.3.6.1 (a)].

(g) Applying the guidance in Note (a) to Table 3.1.1:

(i) The LD_{50} data for ingredients 1 and 3 are used in the $ATE_{mixture}$ calculation since data are available;

(ii) The use of expert judgment is needed to determine what value to use in the $ATE_{mixture}$ calculation for ingredient 2. Since the experimentally obtained acute toxicity range estimate of $200 < LD_{50} < 2{,}000$ for ingredient 2 is existing data developed prior to development of the GHS criteria it does not match up with the ranges provided in Table 3.1.2. The lower end of the range falls within the Category 3 range of 50 – 300 mg/kg and the converted acute toxicity point estimate for an Oral Category 3 ingredient is 100. Given that the converted point estimate is lower than the experimentally determined value of > 200 mg/kg it does not make sense to use the converted point estimate. In this case, one should apply the known information, and 200 mg/kg should be used in the $ATE_{mixture}$ calculation.

(Ref. Doc: ST/SG/AC.10/C.4/2008/23, Annex 2, Example 1)