



SCIENTIFIC SUB-COMMITTEE

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13th Session

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SC3

Brussels, 13 October 1997.

POSSIBLE AMENDMENTS TO THE NOMENCLATURE AND EXPLANATORY NOTES TO  
CLARIFY THE CLASSIFICATION OF CO-ORDINATION COMPOUNDS

(Item II.3 on Agenda)

Reference documents :

40.212 (SSC/11)  
40.460, Annex A/10 (SSC/11 - Report)  
40.412 (HSC/18)  
40.759 (SSC/12)  
40.870, Annex A/13 (SSC/12 - Report)  
41.100, Annex D/1, para. 22 (HSC/19 - Report)

I. BACKGROUND

1. At its 12th Session (January 1997), the Scientific Sub-Committee was not able to reach a consensus on establishing rules in the Explanatory Notes for the classification of co-ordination compounds. It was agreed, therefore, that legal amendments to effect the classification of such compounds in one heading, i.e., 29.42, could be supported and that a definition of co-ordination compounds should be included in the Explanatory Notes.
2. The Sub-Committee tentatively agreed on a draft Explanatory Note definition of co-ordination compounds. It was further agreed that the Explanatory Notes should provide, *inter alia*, for (i) inclusion of polytopal cage compounds; (ii) exclusion of co-ordination compounds containing precious, rare-earth or radioactive metals, pursuant to Note 1 to Section VI; and (iii) exclusion of vitamin B<sub>12</sub> and its derivatives, which are co-ordination compounds which should remain in heading 29.36.
3. Regarding the possible legal amendments, the Secretariat informed the Sub-Committee that the classification of co-ordination compounds in heading 29.42 could be effected by amending the text of heading 29.42 to read "Co-ordination compounds; other organic compounds". However, it was noted that an appropriate text would have to be inserted, either in heading 29.42 or in a Legal Note, to ensure the exclusion of such co-ordination compounds as vitamin B<sub>12</sub> and, possibly, of transition metal salts of organic acids.

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4. The Sub-Committee agreed to study this matter at its next session on the basis of the discussion summarised above.

## II. SECRETARIAT COMMENTS

### Amendments to the Nomenclature

5. At the Sub-Committee's 12th Session, it was noted that vitamin B<sub>12</sub> should not be classified with other co-ordination compounds in heading 29.42, but should instead remain in heading 29.36 (see paragraph 3 above). To provide for this exclusion, the Secretariat would suggest that the text of heading 29.42 be amended to read as follows :
- “Co-ordination compounds (excluding products of heading No. 29.36); other organic compounds”.
6. Also at the 12th Session, one delegate raised the question of the possible transfer of transition metal salts of organic acids, which may have some co-ordinate bonding, to heading 29.42 if that heading were amended to include all co-ordination compounds (see paragraph 3 above). In this connection, the Secretariat would point out that transition metals comprise the elements with atomic numbers 21 to 29, 39 to 47, 57 to 79 and 84 and above. However, Note 1 to Section VI already provides a legal basis for classifying the compounds (inorganic and organic) of a number of the transition metals in Chapter 28, as follows :
- (i) Compounds of precious metals (atomic nos. 44 to 47 and 76 to 79), in heading 28.43;
  - (ii) Compounds of radioactive metals (atomic nos. 43, 61 and 84 and above), in heading 28.44;
  - (iii) Compounds of non-radioactive isotopes of any transition metal, in heading 28.45; and
  - (iv) Compounds of scandium (atomic no. 21), yttrium (atomic no. 39) and the rare-earth metals (atomic nos. 57 to 60 and 62 to 71), in heading 28.46.
7. By a process of elimination, a proposed exclusionary legal Note could be limited to organic acid salts containing cations of the transition metals with atomic nos. 22 to 29, 40 to 42 and 72 to 75. These include titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zirconium, niobium, molybdenum, hafnium, tantalum, tungsten and rhenium. A cursory review of the technical literature reveals a relatively small number of such organic acid salts, and it is unclear whether they all involve co-ordinate bonding. The Sub-Committee may wish to consider, therefore, whether it may be simpler for these salts to be classified with other co-ordination compounds in heading 29.42. The Secretariat would prefer this solution for the sake of simplicity and uniformity of classification.
8. If, on the other hand, the Sub-Committee agrees that heading 29.42 should exclude transition metal salts of organic acids, a new Note 8 to Chapter 29 could be introduced for that purpose. In this connection, the Secretariat wonders whether that Note should exclude such salts of carboxylic acids only or should also exclude those of other organic acids (e.g., sulphonic acids). For the purposes of discussion, both terms (i.e., “organic” and “carboxylic”) are included in square brackets in the proposed texts (see Annex).

9. Further, the proposed new Note could specifically name the cations of all the transition metals cited in paragraph 7 above or it could refer simply to “transition metal salts of organic acids”. In either case, there would be some overlap between Note 1 to Section VI and the proposed new Note 8 to Chapter 29, but, in the final analysis, the classification would not be affected. The proposed amendments in the Annex include a reference to transition metal salts of organic acids, and the option of naming the cations covered is placed in square brackets. The Sub-Committee is requested to give express its preference in this regard.

#### Amendments to the Explanatory Notes

10. The Explanatory Note definition of co-ordination compounds, as drafted at the Sub-Committee’s 12th Session, is incorporated in proposed new Item (1) in the Explanatory Note to heading 29.42 (see Annex). A separate sentence was also inserted for the inclusion of polytopal cage compounds (see paragraph 2 above). Specific exclusions for products covered by Note 1 to Section VI, for other co-ordination compounds such as vitamin B<sub>12</sub> and its derivatives and for transition metal salts of organic acids are also included in the proposed texts.

### III. CONCLUSION

11. The Sub-Committee is invited to examine the proposed legal and Explanatory Note text amendments, as set forth in the Annex. Specifically, the Sub-Committee is asked to decide whether it is necessary to exclude transition metal salts of organic acids (i.e., those not already excluded by Note 1 to Section VI) from heading 29.42 (see paragraph 8 above) and, if so :
- (i) whether such salts of carboxylic acids only or of all organic acids should be covered by proposed new Note 8 to Chapter 29 (see paragraph 8 above); and
  - (ii) whether a simple reference to “transition metal salts” is sufficient or whether each cation should be named (see paragraph 9 above).

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x     x

ANNEXE

PROJET DE REMANIEMENT DE LA NOMENCLATURE ET DES NOTES EXPLICATIVES

CONCERNANT LES COMPOSES DE COORDINATION

(Point II.3 de l'ordre du jour)\_

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ANNEX

POSSIBLE AMENDMENTS TO THE NOMENCLATURE AND EXPLANATORY NOTES

CONCERNING CO-ORDINATION COMPOUNDS

(Item II.3 on Agenda)\_

## PROCEDURE DE L'ARTICLE 16

### A. AMENDEMENT DE LA NOMENCLATURE

[Nouvelle Note 8 au Chapitre 29.

Insérer la nouvelle Note de chapitre suivante :

“8. - Le n° 29.42 ne comprend pas les sels métalliques de transition des acides [organiques][carboxyliques] [qui contiennent un des cations de titane, de vanadium, de chrome, de manganèse, de fer, de cobalt, de nickel, de cuivre, de zirconium, de niobium, de molybdène, de hafnium, de tantale, de tungstène ou de rhénium], même s'ils contiennent des liaisons de coordination.”.]

N° 29.42.

Nouvelle rédaction :

**“29.42 2942.00 Composés de coordination, (autres que les produits du n° 29.36); autres composés organiques.”.**

### B. MODIFICATIONS DES NOTES EXPLICATIVES

[Page 342. Nouvelle Note 8 au Chapitre 29.

Insérer la nouvelle Note de chapitre suivante :

“8. - Le n° 29.42 ne comprend pas les sels métalliques de transition des acides [organiques][carboxyliques] [qui contiennent un des cations de titane, de vanadium, de chrome, de manganèse, de fer, de cobalt, de nickel, de cuivre, de zirconium, de niobium, de molybdène, de hafnium, de tantale, de tungstène ou de rhénium], même s'ils contiennent des liaisons de coordination.”.]

Page 446. N° 29.42.

1. Texte de position.

Nouvelle rédaction :

**“29.42 - COMPOSES DE COORDINATION (AUTRES QUE LES PRODUITS DU N° 29.36); AUTRES COMPOSES ORGANIQUES.”.**

## ARTICLE 16 PROCEDURE

### A. AMENDMENTS TO THE NOMENCLATURE

[New Note 8 to Chapter 29

Insert the following new Chapter Note :

"8. - Heading No. 29.42 excludes transition metal salts of [organic][carboxylic] acids [, containing one of the cations titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zirconium, niobium, molybdenum, hafnium, tantalum, tungsten or rhenium], even if they contain co-ordinate bonds.".]

Heading 29.42

Delete and substitute :

**"29.42      2942.00      Co-ordination compounds (excluding products of heading No. 29.36); other organic compounds."**

### B. AMENDMENTS TO THE EXPLANATORY NOTES

[Page. 342. New Note 8 to Chapter 29

Insert the following new Chapter Note :

"8. - Heading No. 29.42 excludes transition metal salts of [organic][carboxylic] acids [, containing one of the cations titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zirconium, niobium, molybdenum, hafnium, tantalum, tungsten or rhenium], even if they contain co-ordinate bonds.".]

Page 446. Heading 29.42.

1. Heading text.

Delete and substitute :

**"29.42 - CO-ORDINATION COMPOUNDS (EXCLUDING PRODUCTS OF HEADING No. 29.36); OTHER ORGANIC COMPOUNDS."**

2. Nouvel alinéa 1).

Insérer le nouvel alinéa 1) suivant :

“(1) **Les composés de coordination (complexes)** contiennent un ion central (d’ordinaire un métal de transition) et un ou plusieurs ligands organiques qui, ensemble, forment un complexe dont les liaisons ne sont ni covalentes ni ioniques mais intermédiaires entre ces deux types. Le complexe peut être cationique, anionique ou nonionique suivant la somme des charges de l’atome central et du ou des ligands. Sont inclus dans la présente position sont les composés en cage polytopale, y compris les complexes internes et externes de fullerène.

Toutefois, la présente position ne comprend pas les produits compris par la Note 1 de Section VI ou d’autres composés de coordination du n° 29.36 tels que la vitamine B<sub>12</sub> et ses dérivés [ou les sels métalliques de transition des acides [organiques] [carboxyliques] [qui contiennent un des cations de titane, de vanadium, de chrome, de manganèse, de fer, de cobalt, de nickel, de cuivre, de zirconium, de niobium, de molybdène, de hafnium, de tantale, de tungstène ou de rhénium] (voir la note 8 du présent Chapitre)].”.

Les alinéas (1) à (6) deviennent (2) à (7), respectivement.

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2. New Item (1).

Insert the following new Item (1) :

“(1) **Co-ordination (complex) compounds** comprise a central atom or ion (usually a transition metal) and one or more organic ligands, which together form a complex with bonding that is neither covalent nor ionic, but intermediate between the two types. The complex may be cationic, anionic or non-ionic, depending on the sum of the charges of the central atom and the ligand. The heading also includes polytopal (cage) compounds, such as internal and external fullerene complexes.

However, this heading does not include products covered by Note 1 to Section VI or other co-ordination compounds of heading 29.36 such as vitamin B<sub>12</sub> and its derivatives [or transition metal salts of [organic] [carboxylic] acids] [, containing one of the cations titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zirconium, niobium, molybdenum, hafnium, tantalum, tungsten or rhenium] (see Note 8 to this Chapter)].”.

Renumber present Items (1) to (6) as (2) to (7), respectively.

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