CCSG

COAL CHEMICALS SECTOR GROUP

Public Consultation

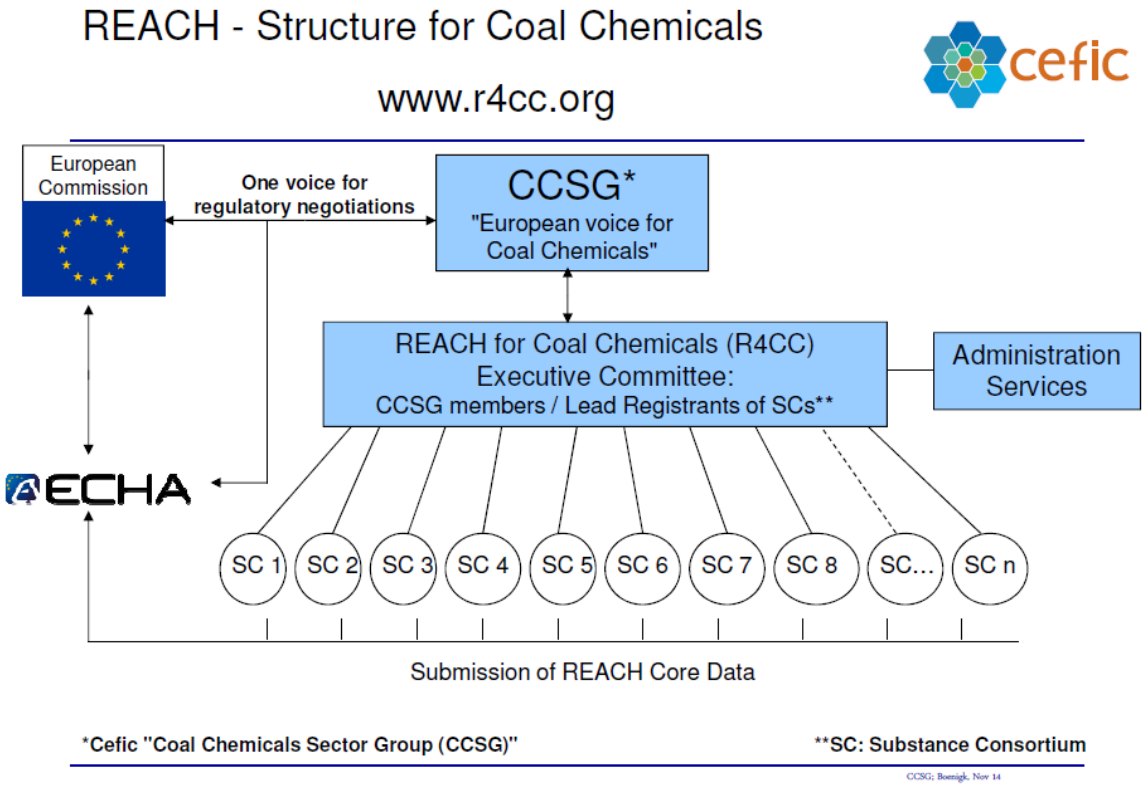
For inclusion of Anthracene oil "(AO; CAS 90640-80-5)" in REACH Annex XIV

Comments of the cefic "Coal Chemicals Sector Group (CCSG)"

INTRODUCTION

This report is the response to the 6th public consultation of ECHA and the Member State Committee on the basis for proposing to prioritise Anthracene oil (CAS No. 90640-80-5), hereinafter referred to as AO, for inclusion in Annex XIV. This report is presented by the cefic "Coal Chemicals Sector Group (CCSG)".

The Coal Chemicals Sector Group (CCSG) represents European producers of chemicals derived from coal tar (COT) distillation: RÜTGERS Group, Koppers Europe Group, Bilbaina de Alquitranes, Industrial Quimica del Nalón, DEZA, Tar Alliance AM, Daw Bytom.



The main product (approx. 50%) of the COT distillation is the distillation residue "Pitch, coal tar, high-temp. (CAS 65996-93-2)", hereinafter referred to as CTPHT. CTPHT is also part of the 6th public consultation for Annex XIV inclusion. The distillates are crude naphthalene and technical fractions (aromatic oils). The major single COT constituents are naphthalene (~10 %), phenanthrene (~4.5 %) and anthracene (~1.3 %). Some constituents (e.g. naphthalene, anthracene, carbazole, phenol, cresols and xylenols) are commercially available. **AO represents approx. 13% of the COT distillation output.**

CTPHT and AO were among the first substances included in REACH Candidate list on 13 January 2010. Early 2014 ECHA made a revised scoring assessment of CTPHT and AO and concluded that the substances meet the requirements for the prioritisation for Annex XIV. On 1 September 2014 ECHA published the Draft Recommendation for inclusion of the substances in REACH Annex XIV and launched stakeholder consultations, running until 1 December 2014.

This report refers to the background document on AO prepared by ECHA for the public consultation. In parallel there is a public consultation in response to the Commission's call for industry information on the economic impacts of the substances proposed for Annex XIV inclusion. The CCSG is also submitting a report on AO to the Commission (via the ECHA website) on economic impacts.

This report has the following sections:

1. Basics for a better understanding of AO
2. Manufacture of AO
3. AO downstream use categories
4. Complexity of AO supply chain interaction

1. Basics for a better understanding of AO

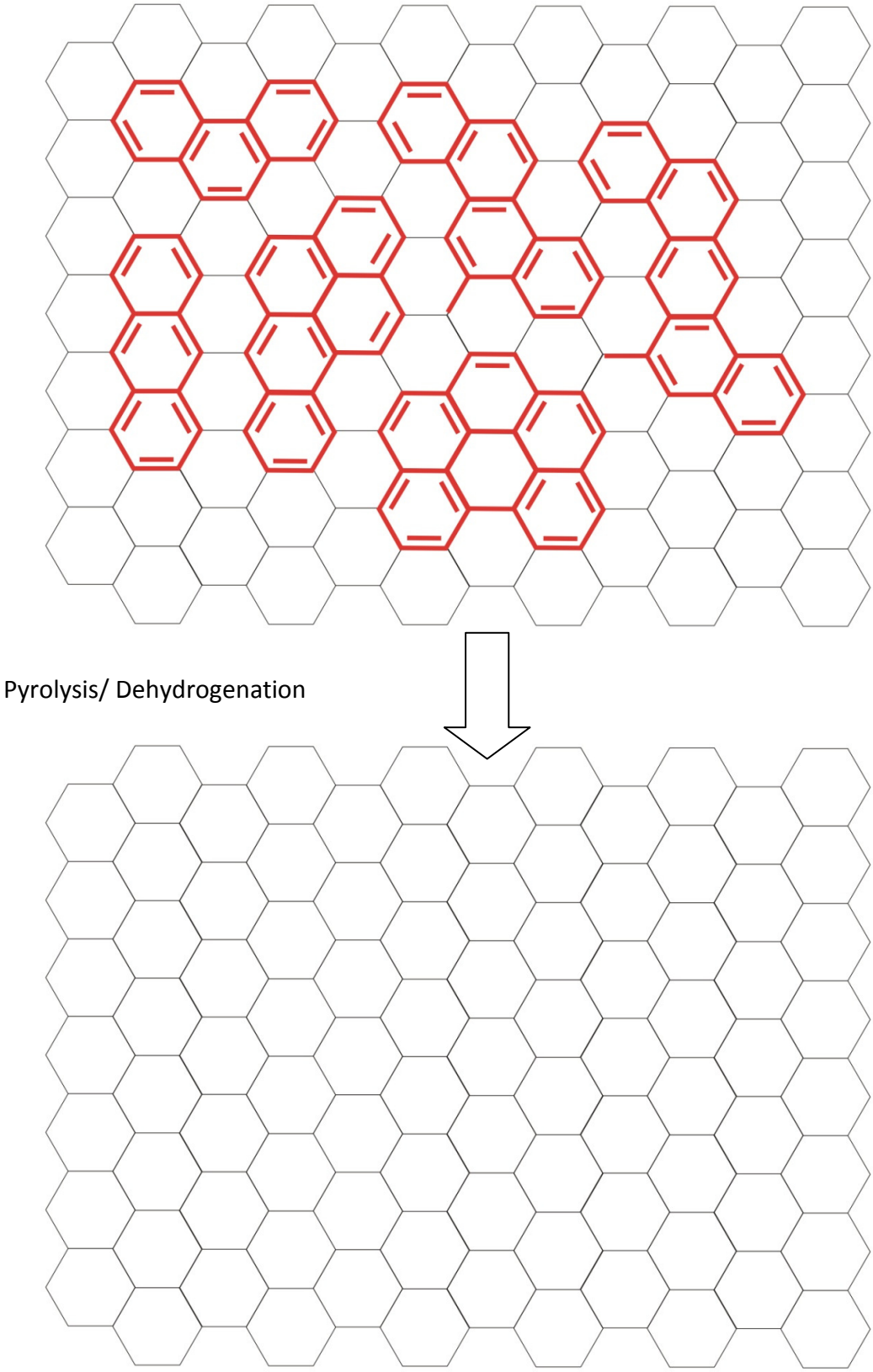
The name "anthracene oil" is misleadingly suggesting that it predominantly contains anthracene. The name results from the fact that the substance "anthracene" crystallizes when cooling AO. AO is a UVCB comprising polycyclic aromatic hydrocarbons (PAHs). AO is an industrial solvent for aromatics and polar substances insoluble in many other solvents (example: solvent for CTPHT). When adding AO to CTPHT, the pitch viscosity is reduced allowing an industrial pitch processing at a lower temperature.

It is not common knowledge that PAHs are building blocks to form graphitic structures. PAHs are planar molecules of a high thermal stability. PAHs polycondensate when heated under oxygen exclusion (pyrolysis) or when cross-linked under air/oxygen atmosphere. This makes AO a large-scale raw material for the production of carbon black (CAS 140203-12-9).

Fig. 1 provides a model for a PAH arrangement capable forming a honeycomb structure (graphene sheet)[1]. In real production this transformation process is more complex and depends on raw material composition and processing conditions. Industrial experience exists for optimising these syntheses.

[1] http://blogs.raincii.com/technical-excellence/rutgers-and-the-precursors-of-graphene-posted-by-winfried-boenigk/

<u>Fig. 1:</u> Model for graphene formation by PAH cross-linking



2. Manufacture of AO

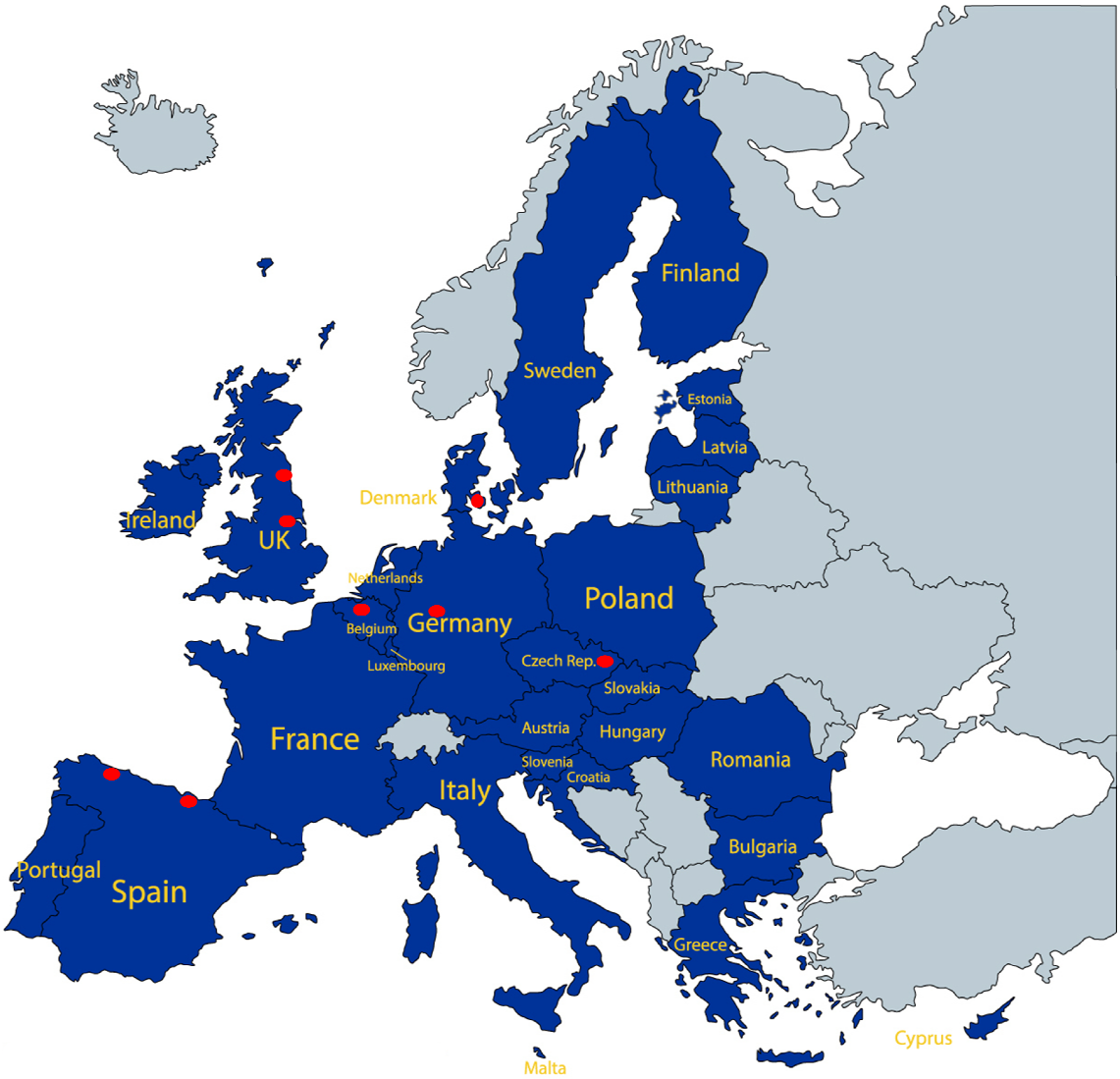
AO is manufactured from "Tar, coal, high-temp. (COT; CAS 65996-89-6[2])" in a yield of 13% [w/w] corresponding to an annual European production of 195,000 t.

AO is produced in eight European plants:

BE, CZ, DE, DK, ES (2 sites) and GB (2 sites).

All other AO REACH registrants have registered for import purposes only.

Fig. 2 EU28 AO production sites (no site in NO, IS, LI)



[2] For more details see CCSG submission for public consultation of Pitch, coal tar, high-temp. (Sep-Nov 2014)

The AO fraction of COT is volatilized in distillation units, condensed and stored in a tank for liquid mixing or loading purposes.

3. AO downstream use categories (comment regarding AO background document chapter 2.2 and 3)

AO is designed for industrial use. AO is either used as such or mixed with other substances to meet the technical specification for a specific use. The annual volume of AO is about 195 kt. The uses can be divided in three categories: intermediate uses, exempted uses and non-intermediate uses.

i) Intermediate uses:

In almost all cases of downstream use, either the first or the second downstream user transforms AO into another substance. These substances are either exempted from registration or from authorisation. The volume of AO used as an intermediate in the EU is approximately 76% **[145 kT]**.

Note that AO is not handled under Strictly Controlled Conditions (SCC) pursuant to Art. 18 in all uses, which means that the registration dossier carries a full registration for these uses despite them being intermediate uses.

1. Intermediate in the manufacture of carbon black:
   The predominant use of AO **[113 kt]** is the manufacture of carbon black (CAS 1333-86-4) under Strictly Controlled Conditions. That explains that some carbon black producers- only use of interest is carbon black production- registered AO for intermediate use only. AO competes with other PAH containing streams from petroleum conversion, more specifically products from steam- or catalytic cracking.

2. Intermediate in combination with CTPHT in the manufacture of pitch coke:

   AO **[13 kt]** is also used in combination with CTPHT to produce coke (coal tar) high-temp. pitch (CAS 140203-12-9), a substance exempted from registration and authorisation under Annex V[3].

3. Intermediate in the manufacture of other substances:
   AO is also used as an intermediate under strictly controlled conditions in the manufacture of other substances **[19 kt]**, e.g. anthracene paste (CAS 90640-81-6), anthracene (CAS 120-12-7), carbazole (CAS 86-74-8) .

[3] ECHA Guidance for Annex V Exemptions from the obligation to register, Version 1.1, Nov 2012, p.43

ii) Exempt uses

1. Authorisation exemption as fuel

   AO that is not sold for other purposes can be used as fuel. This use is usually avoided for economic reasons. The use as fuel is exempt from authorisation under article 56 (4)(d).

2. Exemption as biocide

   AO is also used for creosote production **[44 kt]**, a heavy-duty preservative to protect wood from biological attack (BPR PT8). This use is exempted from authorisation (Art. 56 (4)(b).

iii) Non-intermediate uses:

1. Use as industrial solvent

   AO has a high solubility for higher molecular polar substances. Therefore AO is used in some special industrial solvent applications **[5 kt]**.

2. Heavy-duty corrosion protection

AO can serve in mixture with CTPHT as binder for solids in heavy-duty corrosion protection. AO is mixed with CTPHT and with solids for heavy-duty corrosion protection in contact to soil, water and salt. Typical uses are coatings for pipelines and nuclear waste containers **[1kt]**.

4. Complexity of AO supply chain interaction (response to AO background document chapter 4)

Complexity of interactions (response to Background Document chapter 4)

The communication through the supply chain proofs to be difficult. The focus of each sector is different and it is extremely difficult to get the industries aligned in a project. This experience was gained when working on the Chemical Safety Reports for REACH registration. The confidentiality of some information requires using consultants for the exchange of information in the supply chain. Additional efforts to correct and refine the information and the conclusions are needed as the consultants usually understand the REACH process but not the supply chain and uses of a product.

Organisation of compliance with competition law requires much time which is in contrast to the more optimistic view of the Background Document Chapter 4. This means that AO

producers anticipate that authorisation dossier preparation will need more time than foreseen by ECHA.

CCSG Members are open to provide additional information clarifying questions.