European Advanced Carbon and Graphite Materials Association

SUBSTANCES OF CONCERN USED FOR THE MANUFACTURING OF BATTERY-GRADE GRAPHITE

ECGA welcomes ECHA's initiative to assess substances of concern used for the manufacturing of batteries and their raw materials. As the association representing the European manufacturers of advanced carbon and graphite materials, including synthetic graphite for battery anodes, we play a pivotal role in ensuring the chemical safety and recyclability of this strategic supply chain for the EU.

In this paper, we underline that a balanced and technically informed assessment is vital. Specifically, the evaluation of substances used in the *manufacturing process* of battery materials must distinguish between those that remain present in the final product and those, like **intermediates, that are fully transformed and pose no risk to downstream industrial users or end-consumers**. We fear that overly broad restrictions could inadvertently undermine the EU's strategic autonomy by jeopardizing the production of essential materials like synthetic battery-grade graphite within Europe.

Battery-grade graphite does not contain any NaOH, Hcl or H_2SO

In the purification of natural graphite for battery applications, various chemical agents including sulfuric acid, hydrochloric acid, and sodium hydroxide are employed within tightly controlled industrial processes. Sulfuric acid is used as a principal leaching reagent, hydrochloric acid serves in subsequent impurity removal, and sodium hydroxide is leveraged for the treatment of silicate and metal oxide contaminants. **These substances are introduced sequentially in multi-step closed-loop systems designed to optimize impurity extraction and maximize carbon purity.**

Throughout these processes, each reagent is either fully consumed in chemical reactions or neutralized during comprehensive effluent treatment protocols. Water and chemical recycling practices mandated by EU industry standards, particularly those reflecting **Best Available Techniques (BAT), ensure that no significant emissions or hazardous chemical residues encompass the final, high-purity graphite product or escape into the environment.** Continuous monitoring and effective management further minimize environmental impacts and preclude acid or alkali discharge.

Importantly, sulfuric acid, hydrochloric acid, and sodium hydroxide do not exhibit the persistent, bioaccumulative, or toxic characteristics relevant to finished battery materials as defined by the EU Battery Regulation (Regulation 2023/1542). Their risk profiles depend exclusively on containment and process management, both of which are parameters systematically maintained by EU graphite

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producers. Therefore, **ECHA does not need to take any further action about NaOH, Hcl or H_2SO in order to ensure the health and safety of European workers, or the recyclability of EU-made batteries.**

Battery-grade graphite does not contain coal-tar pitch either

Coal-tar pitch, high temperature (CTPHT) is an **essential binder and coating agent for the production of synthetic graphite.** The main feedstock for synthetic graphite is petroleum coke. Petroleum coke is sold in the form of irregular chunks or lumps which need to be "glued" together to create blocks of synthetic graphite. This is where CTPHT plays an indispensable role.

CTPHT is used for the manufacturing process of battery-grade graphite, but not only. It is also used for the production of graphite electrodes used by the steel industry[1], for anodes in the aluminium industry, and for high-performance, specialty graphites crucial for the aerospace, energy (hydrogen, nuclear, power transfer), transport and defence industries.

In 2017, CTPHT was listed as a substance of very high concern under REACH, because it contains polycyclic aromatic hydrocarbons (PAH), which are carcinogenic. It was added to Annex XIV (Authorization List) through Commission Regulation 2017/999.

During this process, ECHA considered that CTPHT an intermediate under REACH because **CTPHT is completely transformed during the graphitisation process**. At temperatures above 1000°C, the pitch is first converted into pitch coke (CAS No. 140203-12-9, exempted from registration), which binds with the other types of cokes present in the furnace. All the cokes are then further heated at temperatures above 2200°C. Graphitisation happens at this stage, and the result is a very pure form of graphite (CAS No. 7782-42-5, graphite is not hazardous).

The safety of this transformation was noted during an ECHA report from 2023[2], which states that "graphite as such is not of concern as graphitization occurs at very elevated temperature (above 2200°C) and, at these temperatures, all carbon-containing substances (including CTPHT) are converted into graphite." As a result, **our members using CTPHT for the manufacturing of synthetic graphite does not create any hazard for end-consumers or industrial players downstream.**

This 2023 ECHA report was not focused on graphite. Instead, it investigated the use of CTPHT for articles such as polymers (e.g. rubber, elastomer, polyethylene) or paints, coatings, sealants, adhesives and waterproofing materials. Nonetheless, given ECHA's assessment, our association decided to commission

[1] In this case, CTPHT is not used for coating but as an impregnating agent. It is nonetheless also transformed into coke during the first step of the graphitisation process.

[2] Annex XV report an assessment of whether the use of pitch, coal tar, high temperature in articles should be restricted in accordance with article 69(2) of REACH :

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an in-depth report to consultancy RPA. Our members wanted to know whether CTPHT could be substituted in the future. The executive summary of this report to the current submission, and we are ready to share the full version with ECHA.

According to RPA's report, there exists **currently no technically and economically viable alternatives** to CTPHT that match its unique combination of properties (high carbon yield, graphitisation capability, binding performance) essential for our high-performance materials. Thus, ECGA has actively communicated to the Commission that **CTPHT, as an intermediate, does have an essential character for the European graphite industry.**

Things might change in the future, as the RPA consultancy found that bio-based feedstocks may present a future alternative with a reduced hazard profile. While we agree with this external assessment, we would like emphasis that any potential transition will require a careful, holistic assessment. Potential alternatives must be evaluated not only against technical requirements but also in light of their market availability, economic feasibility, and overall sustainability credentials.

Besides, following a new Commission's action undertaken under the Industrial Emissions Directive, ECGA has been involved in discussions related to maximum exposure limits to PAH for workers employed in our factories. The Commission's goal and ours is to reduce exposure as much as possible through new, better filters.

In this context, we do not believe it is necessary for ECHA to initiate duplicate regulatory action under the Batteries regulation. REACH and the Industrial Emissions Directive already regulate sufficiently CTPHT.

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