

Press release

Duisburg, 14th of April 2020

Grillo-Bromine-Reduction

Industrial process for recovery of bromine from electronic waste

Brominated flame retardants make the recycling of electronic scrap very challenging. Grillo-Werke AG has developed an innovative process where bromine impurities from diverse waste and product streams are converted into safe bromide.

This Grillo-Bromine-Reduction process is patented and already successfully used in industrial scale at one of Grillo's plants in Duisburg.

Around 1.7 million tons electronic scrap must be recycled every year in Germany. This can release toxic halogens or oxo-halogen compounds (for example high toxic and carcinogen bromate) because of halogenated flame retardant.

While treating metal oxide residual products from recycling of electronic scrap (Figure 1) the Duisburg experts did challenge themselves to convert the bromine impurities into a safe and uncritical substance.

The Grillo-Bromine-Reduction jointly developed by R&D and production makes use of the strong reducing agent sodium hydrogen sulfite. This at first glance simple method is actually a new way to avoid the formation of toxic bromate. The dangerous bromine vapors become directly an easily, safe and environmentally friendly transportable bromide product, which can further industrially be used.

The process enlarges the circular economy of waste of electrical and electronic equipment (WEEE) to the element bromine. The valuable but hard to handle bromine can be recovered and be used, e.g. as raw material for flame retardant (Figure 2).

“We are proud that we managed to develop a highly efficient process on industrial scale and that the resulting products are completely bromine free” said Dr. Oliver Groß. Dr. Céline Réthoré, responsible for the development of this process, added “the main advantage is that this process is industrially scalable, can be easily adapted to individual processes – and can also be transferred to other processes where iodine, bromine or chlorine is involved.”

The process has already been applied in exhaust air scrubber from laboratories. The process is also applicable in the pharmaceutical, agrochemical and galvanic industries: everywhere where halogen containing - in particular iodine and bromine containing- material streams have to be treated. Grillo is looking for partners in others application areas to allow an ecologically ideal treatment of halogen compounds.

“the process can be transferred to other processes where bromine or chlorine is involved”

The Grillo-Werke AG: Progress as Tradition

The family owned company Grillo with headquarters in Duisburg was founded in 1842. It is now one of the market leaders in the manufacture of Zinc and Sulfur in Europa. The worldwide active group is divided in the business areas Chemistry, Zinc Oxide, Metal and RHEINZINK with around 1.500 employees in total.

The products portfolio comprises on the one hand Sulfur chemicals, Acids, Sodium and Zinc Salts as well as Zinc Oxide for diverse applications, and on the other hand Zinc bands, sheets, wires, bars and anodes as well as Zinc Powder for battery and Construction Zinc for roof covering and roof drainage.

All of this realized under continuous product and process development and respecting the strict safety and environment protection rules.

Following the guiding theme “Progress as Tradition”, Grillo is attaching a lot of importance to the job education as well as the further training of its employees.

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Figure 1

The Grillo-Bromine-Reduction extends the awarded Closing the loop-Process between Grillo and Aurubis

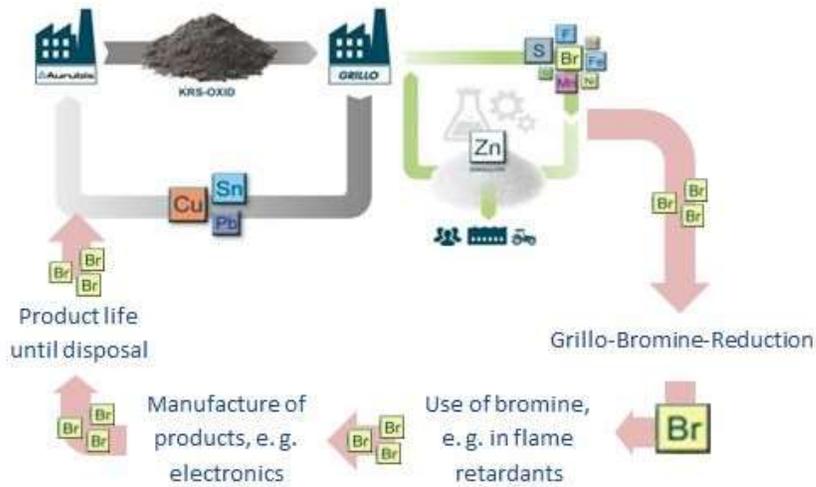


Figure 2

The Grillo-Bromine-Reduction enlarges the circular economy of electronic scrap to the element Bromine

