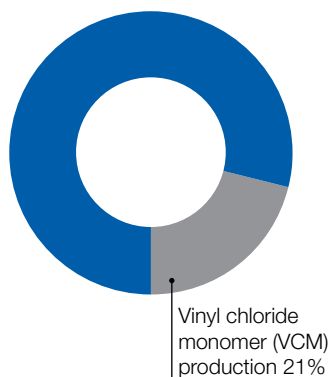




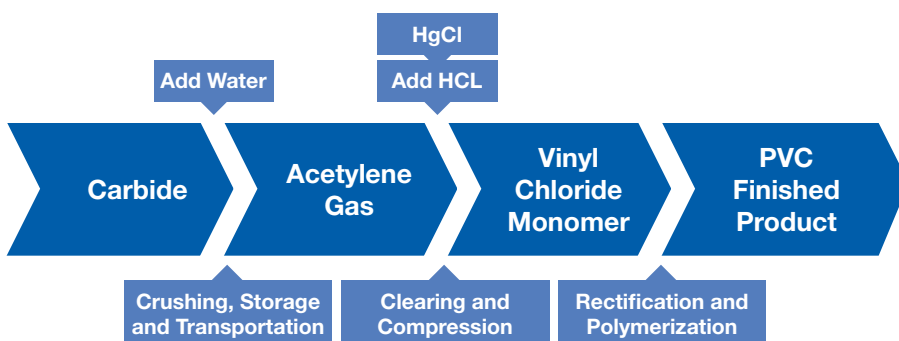
INC 2 BRIEFING PAPER SERIES

Mercury in VCM and PVC Manufacturing

How Mercury Is Used



Poly vinyl chloride, or PVC is a type of plastic that is used for everything from water and sewer pipes to plastic toys and clothing. Vinyl chloride monomer, or VCM, is the building block of PVC.



Most manufacturing of PVC around the world uses natural gas or petroleum as the “feedstock” or raw material from which the plastic is manufactured. However, most PVC manufacturing in China uses a different process that starts with coal as the feedstock. In that coal-based process, mercury is a catalyst to spark the chemical reaction among ingredients. In 2009, the coal-based process was used at 94 of 104 China’s VCM plants, although these plants accounted for only about 63% of China’s PVC production, according to the latest data provided by their trade association.

Some of the mercury catalyst is lost during this industrial process and must be continually replenished. It is poorly understood exactly where the lost mercury ends up and how it gets there, but we do know that PVC manufacturing consumes over 800 metric tons of mercury each year, based on how much mercury is purchased by the industry to replenish the catalyst. China’s PVC manufacturing industry represents one of the most significant uses of mercury in the world today.

Issues

Nearly all coal-based PVC manufacturing occurs in China, because the petroleum-based alternative process uses less energy, is cheaper in most countries, and superior environmentally. For China, the coal-mercury process is considered preferable domestically because it relies upon China’s own natural coal resource, rather than petrochemical imports. There are also practical barriers against using the petroleum-based process in the interior (non-coastal) regions of China, where much of the PVC production capacity exists or is planned.

Solutions

In China, coal will likely remain the principal PVC feedstock material. Thus, a key to reducing mercury use in this sector is to find a less toxic but effective replacement catalyst. Significantly, several companies have plans for early 2011 to pilot test a mercury free catalyst in China, and commercial demonstration testing could soon follow.

Treaty Control Measures

Given the amount of mercury consumed by this sector, the treaty control measures should set a clear future policy direction for mercury-free PVC production. The treaty should enable China to continue to produce PVC, but require the use of a mercury free process as soon as possible. This can be accomplished by phasing out the use of VCM but making allowances for continued use in the short term if the development of a mercury free catalyst takes longer than expected. Technical assistance should be made available to China as needed in removing mercury from their PVC manufacturing industry, in particular to find an effective non-mercury catalyst.