

Iron Removal from Hydrochloric Acid

(Extracted from the Diaion Manuals pages 238 to 239)

be accomplished with only water theoretically, but the solution should be kept acidic lest iron(III) hydroxide might precipitate. Thus, diluted HCl solution, e.g. 0.5N·HCl, is necessary. There is a report of the utilization of the residual HCl in towers: After the HCl solutions are treated with IERs and the inner solutions are drained, the remaining HCl solutions are diluted with water and are mixed uniformly by aeration from the bottom of the IER tower and finally fed with eluents upward. ⁽⁵²⁾

The HCl solution collected by thermal decomposition of waste waters usually contain a small amount of free chlorines. These solutions should be treated by activated carbons as preparation of IER treatment.

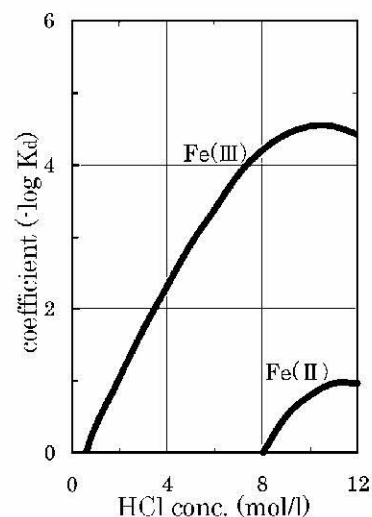
5. Removal of Iron from Hydrochloric acid

Both the HCl solutions collected by thermal decomposition of waste waters containing halogenated organic compounds and the by-product HCl solutions generated from chlorinations in organic syntheses hold irons that contaminate into such solutions from relevant facilities. As a result, these HCl solutions color yellow. Such yellow HCl solutions turn colorless and clear, once the contaminated iron is removed by the treatment with SBAERs.

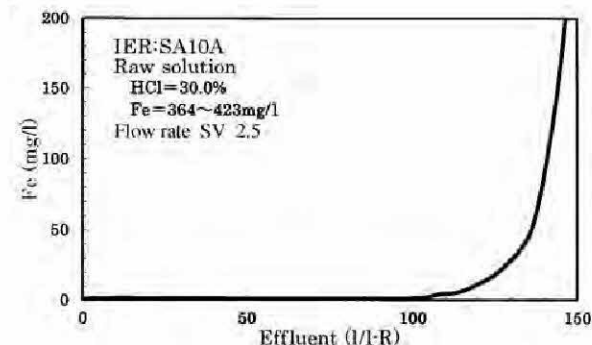
Most heavy metals exist in HCl solutions not as cations but as chloro complex anions. Such heavy metal chloro complex anions have strong affinity with Type I SBAERs, e.g. SA10A as shown in Fig.VII-5-1. ⁽⁵⁰⁾

Thus in this case, iron chloro complex anion, FeCl_4^- , is easily adsorbed by SA10A of Cl-form. Fig.VII-5-2 ⁽⁵¹⁾ illustrates an example to remove iron from 30% HCl solution.

The iron adsorbed by IERs is desorbed as iron(III) chloride by hydrolysis in advance of regeneration. Such desorption, regeneration, can



[Fig.VII-5-1] Distribution coefficient of Iron ion ⁽⁵⁰⁾



[Fig.VII-5-2] Removal of Fe from hydrochloric acid ⁽⁵¹⁾

Another notice is that iron (II), if exists in HCl solutions, should be oxidized into iron (III) in advance, since it cause the iron leakage. Furthermore, the adsorption rate is affected by the feed rate when the HCl and iron concentrations of raw HCl solution are comparatively low and high respectively.