عنوان مقاله:

Corrosion control on amine units: A continuous up-grade of design and performance from decades of experience

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خلاصه مقاله:

A review was made in 2004 about the corrosion experience on DEA and MDEA amine units over 4 decades and more than 100 amine units, most of them working in sour conditions, i.e. with H2S, with amine concentrations up to respectively 40% and 50% weight and with amine loading factors up to 0.9 MIM.. This review is now complemented with additional background, and the design and operation philosophy is given an up-date in order to cover new needs particularly as regards high amine loading. For sour amine units, the satisfactory use ofC Steel equipment simply requires avoiding too high flow velocities leading to erosion-corrosion on rich amine sections. Precise limits are given depending on the amine loading. On the other hand, both very high amine loading and high velocities can easily be achieved as long as 316L stainless Steel is used instead of C Steel on high velocity areas. Air entries and too high reboiler temperatures must also be avoided as they lead to corrosive degradation products. All these issues are easily resolved when quite simple design and operating practices are consistently applied, as detailed in this article. Concerning sweet gases (i.e. with C~ only) a few DBA units have been subjected to unprecedented corrosion damages mainly occurring on AISI 410 and 304L stainless steels, despite apparently mild corrosive conditions. This corrosion is due to particular interactions between the metal, the corrosion products and the complexing amine degradation products. Field experience also shows the satisfactory resistance of AISI 316L material This experience is now incorporated in the new design bases of sweet amine units. The use of AISI 316L is extended to all areas potentially prone to corrosion. As regards present and future needs, users are more and more looking for energy efficiency, reliability and flexibility to gas flow rate, amine type... These joined requirements are fully incorporated in present design bases, which promote the use of stainless Steel instead of Carbon Steel on all corrosion susceptible sections (but only on those), while remaining with generic amines. This policy allows operating those units under high amine loading rates (> I MIM) without flow velocity restrictions and without being limited to special types ofamines. The use ofStainless steels on sensitive areas also minimizes inspection- maintenance requirements while giving a high flexibility to increases in amine and gas flow rates. Keeping this versatility and flexibility to flow rates and to the ... widest range of amines, including some in development, is thought

کلمات کلیدی:

corrosion, amine, erosion-corrosion, H2S, design