

عنوان مقاله:

Cracked Gas Compressor(CGC) fouling, Anti-fouling technologies and treating process to prevent fouling

محل انتشار:

ششمین کنفرانس بین المللی پژوهش های کاربردی در علوم و مهندسی (سال: 1401)

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نویسندگان:

Mehdi Yosefinejad - *Sharif university of technology, chemical engineering department, Azadi Ave. Tehran, Iran*

Bahare Akbari, - *Iran university of science and technology, chemical engineering department, Tehran, Iran*

Hossein Rajabi, - *Shazand petrochemical company (PGPIC), olefin plant, Arak, Iran*

Reza Nasari, - *Bandar imam petrochemical company (PGPIC), olefin plant, Mahshahr, Iran*

Reza Jabari, - *Arya Sasol Polymer Company (ASPC), Asalouyeh-Boushehr, Iran*

Saeid Alami milani - *ESTORK industrial group technical service, Tehran, Iran*

خلاصه مقاله:

Olefins are produced by thermal or catalytic cracking of hydrocarbons from gaseous such as ethane, propane and butane, liquefied petroleum gas, to the liquid feedstock such as light and heavy naphtha, gasoil and vacuum gas oils. The type of feedstock depends on the availability. The production process can be divided into four main sections; cracking furnaces quench sections (direct and indirect), compression units, and separation columns. The pyrolysis takes place in the tubular reactors, inside the firebox of the furnace, at high temperature, low pressure and a very short residence time. The cracked gas compressor (CGC) is the critical system in modern ethylene plants. This compressor drives gases from the crackers for downstream separation. Unsaturated hydrocarbons which formed during the cracking process are reactive species. Cracked gas contains appreciable amounts of highly reactive diolefins and acidic compounds that are subject to oxidation and/or polymerization. Unsaturated contribute to free radical generation via thermal reaction or Dienes-Alder mechanism or oxidation at the high temperatures found in the compressors, forming polymers. These polymers tend to accumulate in the compressor discharge lines, casing and after-coolers. Costs associated with CGC fouling are high, and they can increase exponentially as conditions deteriorate. Result: The reliability of CGCs remains a serious issue in spite of improvements in design and system metallurgy. Therefore, olefins plants are exploring new techniques to optimize compressor performance and run length. Many operators are discovering that chemical additives can offer attractive advantages for fouling control. Fouling in a cracked gas compressor can negatively affect plant economics. Initial efficiency loss does not increase costs significantly if there is adequate turbine capacity; increasing the turbine speed prevents lost production. However, once the turbine is limited, any additional loss in efficiency results in reduced throughput and a dramatic increase in the total cost of operation (TCO). In addition to energy cost and production loss, a fouled compressor may require an unscheduled shut down. Even before shutting down, a fouled machine is usually operated at higher-than-desired suction pressure, in order to maintain the desired discharge pressure. This affects unit economics; increasing the first-stage suction pressure increases the furnace pressure and lowers selectivity towards ethylene. Organic

... fouling in process gas compressors (PGC) is an important issue that many olefin plants must ma

کلمات کلیدی:

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