

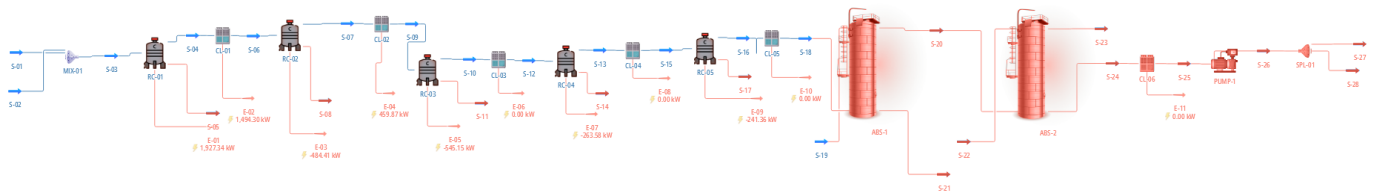
Production of Sulfuric Acid

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Background & Description:

Sulfuric acid is one of the most widely used chemicals in the world, with a wide range of applications in various industries such as fertilizers, detergents, batteries, and pharmaceuticals. It is also an important raw material for many other chemical processes. The production of sulfuric acid involves a complex chemical process that requires careful control and monitoring to ensure high yields and purity. The production of sulfuric acid by the contact process involves a series of steps that require careful control and monitoring to ensure high yields and purity. The process begins with the combustion of elemental sulfur or sulfide ores to produce SO₂ gas, which is then purified before being fed into a catalytic converter. The converter contains a catalyst such as vanadium pentoxide or platinum, which facilitates the conversion of SO₂ to SO₃ at temperatures ranging from 450-500°C and pressures of 1-3 atm. The resulting SO₃ gas is then mixed with water vapor in an absorption tower to produce H₂SO₄, which is condensed and purified through distillation. The purity of the sulfuric acid produced can vary depending on several factors such as feedstock quality, operating conditions, and equipment design. One of the challenges associated with sulfuric acid production is controlling emissions of SO₂ gas into the atmosphere. To address this issue, many plants use various methods such as scrubbers or electrostatic precipitators to remove SO₂ from flue gases before they are released into the environment.



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Results:

Object	S-04-Hot	S-06-Cold	S-07-Hot	S-09-Cold
Temperature(K)	828.06	222.253	417.462	222.359
Pressure(kPa)	1500	1350	1250	1100
Mass Flow(kg/h)	8841.32	8841.32	8841.32	8841.32
Molar Flow(kgmol/h)	251.3	251.3	242.942	242.942
Volumetric Flow(m ³ /h)	1533.83	766.703	1115.93	909.853

Object	S-10-Hot	S-12-Cold	S-13-Hot	S-15-Cold	S-16-Hot	S-18-Cold
Temperature(K)	310.355	310.355	319.534	319.534	319.943	319.943
Pressure(kPa)	1100	950	950	800	800	650
Mass Flow(kg/h)	8841.32	8841.32	8841.32	8841.32	8841.32	8841.32
Molar Flow(kgmol/h)	239.237	239.237	238.834	238.843	238.825	238.825
Volumetric Flow(m ³ /h)	1055.09	1221.68	1238.86	1471.14	1472.05	1811.76