

Product of Flue Gas Desulphurization - Semi-Dry Absorption method

Reference in RIP 3.10 from REACH	UVCB subtype where the source is chemical or mineral and the process is a synthesis / refinement.
Name	Product of Semi-Dry Absorption method of Flue Gas Desulphurization (IUPAC name)
Joint submission	JS_SDA_Product
EC Number	931-259-6
CAS Number	N/A
Description	Product of Semi-Dry Absorption method of Flue Gas Desulphurization. Main components are calcium sulphate, calcium sulphite, calcium carbonate, calcium hydroxide, calcium chloride, etc.
Origin	Reaction product of hot flue gas is produced from coal combustion (possibly with co-combustion of other material) passing through sprayed water suspension sorbent (typically lime or calcium hydroxide).
Process	<p>The general description of desulphurization process related to SIP.</p> <p>The semi-dry method of desulphurization process consists on SO₂ absorption by means of calcareous sorbent in form:</p> <ul style="list-style-type: none"> - sprayed sorbent lime milk in a form of fine drops or mist - dry sulphur oxide in a water mist. <p>Flue gases are led to reactor directly from the boiler or after partial dedusting. The sorbent suspension is given to the reactor at the same time.</p> <p>Process of the desulphurization is chemically described as follow:</p> $\text{Ca(OH)}_2 + \text{SO}_2 + \frac{1}{2}\text{H}_2\text{O} \rightarrow \text{CaSO}_3 \times \frac{1}{2}\text{H}_2\text{O} + \text{H}_2\text{O}$ $\text{Ca(OH)}_2 + \text{SO}_3 = \text{Ca SO}_4 \times \frac{1}{2}\text{H}_2\text{O} + \frac{1}{2}\text{H}_2\text{O}$ $\text{Ca(OH)}_2 + 2\text{HCl} = \text{Ca Cl}_2 + 2\text{H}_2\text{O}$ $\text{Ca(OH)}_2 + 2\text{HF} = \text{CaF}_2 + 2\text{H}_2\text{O}$ $\text{Ca(OH)}_2 + \text{CO}_2 = \text{CaCO}_3 + \text{H}_2\text{O}$ <p>Typical range of process temperature is 50 – 150 °C.</p> <p>The desulphurization product in a form of a mixture with ash either in a pure form is collected partly in a bottom part of the reactor and mostly in dedusting device.</p> <p>The desulphurization product often is multiple turned back to the reactor.</p> <p>Humidity of this product is generally in a range of 1-2% .</p> <p>Content of ash in a semi-dry desulphurization product comes to dozens % in pure SDA content of ash comes to few %.</p> <p>There is also a nonreacted sorbent in semi-dry desulphurization product content.</p>
Chemical composition	Chemical composition of SDA Product is reported as the mass percent of following components:

Component	Min.(%)	Max.(%)
Calcium chloride dihydrate 10035-04-8	0	50
calcium dihydroxide 1305-62-0	1	50
Calcium sulfate dihydrate 10101-41-4	0	79
calcium carbonate /471-34-1	1	35
Calcium Sulphite Hemihydrate 29501-28-8	0	70
calcium fluoride 7789-75-5	0	5