

Selection of carbon monoxide separation process

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Carbon monoxide (CO) is typical gas component in exhausted gas and it usually has purged or oxidized because of its high reactivity. However CO can be used in oxidization or combustion process and recycle of CO is helpful for resource and energy saving. Separation of CO from gas mixture with high concentration of nitrogen can be achieved by either pressure swing adsorption (PSA) or chemical absorption process like COSORB. PSA shows varying product purity depending on input gas CO concentration or pressure change. On the other hand, absorption can maintain stable purity and recovery even in low CO concentration. Thus, selection of CO separation process is highly dependent on CO concentration. We studied these selection of exhausted gas from ironmaking process. We evaluated economics of PSA and absorption, and performed sensitivity analysis on CO concentration as well. Operation cost of PSA is strongly related with compressor size and energy use, while operation cost of absorption shows relationship with reboiler duty and solvent supplement, which is affected by CO amount in product. We chose optimum process for CO separation based on these result in different inlet CO concentration.