Chemical utilization of byproduct gases from steel works as a C1 resource

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From the steel making process, valuable gases which include syngas (CO and H2) are produced and most of them is currently used as a fuel to produce heat and electricity. In order to utilize syngas from steel works, various technologies were examined to purify the byproduct gases including LDG and COG. By using COSORB process, CO was selectively separated from LDG. COG was used as a feed gas for H2 production by steam reforming process. The operation of the in-site pilot-scale plant with purification process has been done, and CO and H2 could be produced with high purity.
Another strategy of utilization of these gases is direct use of LDG and COG mixture without separation and reforming, respectively. Cu/ZnO based catalysts have been developed to synthesize methanol and higher alcohols. The chacteristics of the catalysts developed in this study will be presented and the chemical utilization of LDG and COG as a C1 resource will be suggested.