

The extent of the CO₂ concentration of mine drainage and its effect on stream water quality

YOUNGWOOK CHEONG^{1*}, GILJAE YIM¹, CHAMTEUT OH¹,
JOOSUNG AHN¹

¹KIGAM, Yuseong-gu, Daejeon 34132, Korea

(* correspondence: ywc@kigam.re.kr)

¹KIGAM, Yuseong-gu, Daejeon 34132, Korea

(gjyim@kigam.re.kr)

¹KIGAM, Yuseong-gu, Daejeon 34132, Korea

(d11333@kigam.re.kr)

¹KIGAM, Yuseong-gu, Daejeon 34132, Korea

(jsahn@kigam.re.kr)

This study was carried out to find the range of CO₂ concentration in mine drainages and effect of CO₂ on the stream water chemistry. Twenty seven mine drainage samples and stream water samples were collected from the abandoned coal mine areas. pH, ORP, DO and EC were measured in the field and Fe, Al, Mn, Ca, Mg, SO₄ and Inorganic carbon (IC) were analyzed in laboratory. The concentration of CO₂ was high in mine drainages originated from mine voids below water tables. As a result of the correlation analysis, CO₂ had a high correlation with Mg (0.76) and SO₄ (0.78). Inorganic carbon was correlated with pH (0.51) and EC (-0.58). As the mine drainage flowed and mixed with a stream, the concentration of CO₂ and the IC decreased drastically. The reason for the decrease in CO₂ in mine drainage and the affected stream water seemed to be to balance the CO₂ partial pressure in the atmosphere. Aluminum, Mn, Ca and Mg were not subject to significant concentration changes after dilution due to mixture of the mine drainage and the stream.