Bioremoval of molybdenum from aqueous solution

ABSTRACT

Molybdenum is very toxic to ruminants with level as low as 2 parts per million can cause severe scouring. Its contamination of waters and soils in agricultural areas needs novel removal technology. In this work we demonstrated a novel method of molybdenum removal from aqueous solution using the dialysis tubing method coupled with molybdenum-reducing activity of Serratia sp. strain Dry5. The enzymatic reduction of molybdenum is molybdenum blue, a colloid that does not pass through dialysis tubing. The calculated maximal rate of molybdenum blue production (VMoblueMax) was 0.264±0.034 mM (Mo-blue h)-1 and the concentration of molybdate resulting in the half-maximal rate of reduction (KMo) was 21.78±3.89 mM molybdate and the specific maximal rate of Mo-blue production was approximately 80 mM (Mo-blue.hr.mg cells)-1 indicating an efficient system with high tolerance towards molybdenum.

**Keyword:** Agriculture; Dialysis tubing; Molybdenum; Molybdenum blue; Serratia sp.