



Element replacement in $\text{Mo}_2\text{Ga}_2\text{C}$ via molten salt synthesis

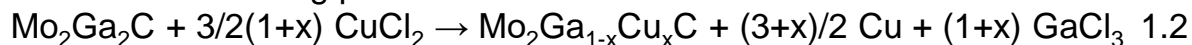
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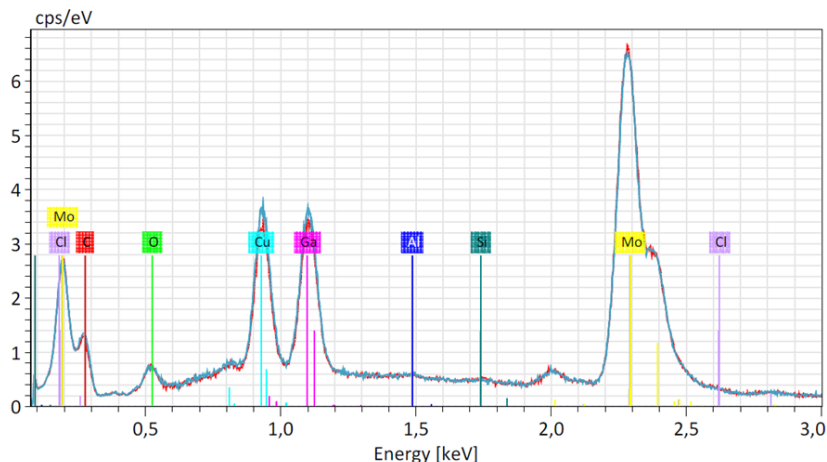
Lewis-acids like ZnCl_2 or CuCl_2 offers a way to synthesize MXenes without HF. Using ZnCl_2 , the synthesis is limited to Al-containing MAX-phases [1]. By using Lewis-acids with a higher redox-potential, the method can be extended for other A elements like gallium or silicon [2]. Other metals like tantalum, or niobium could also be delaminated.

Herein, we report the partial replacement of gallium by copper using $\text{Mo}_2\text{Ga}_2\text{C}$, CuCl and CuCl_2 .

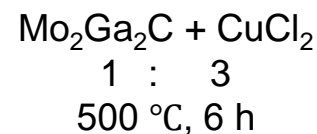
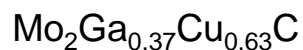
During variation of the reaction temperature, the formation of a new MAX-phase could be observed via XRD, assuming reaction 1.2 is taking place.



EDX measurement identified this phase as $\text{Mo}_2\text{Ga}_{1-x}\text{Cu}_x\text{C}$, where x is $2/3$. Excess copper could be easily removed by treating the sample with concentrated HCl under reflux



element	At.-%
Mo	50,33
Ga	9,30
Cu	15,92
O	7,68
C	15,25
Cl	0,56



[1] M. Li, J. Lu, K. Luo et al., *JACS*, vol. 141, no. 11, pp. 4730–4737, 2019.

[2] Y. Li, H. Shao, Z. Lin et al., *Nat. Mater.*, vol. 19, no. 8, pp. 894–899, 2020.