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A didactic strategy on teaching source mixing isotope models based on the analogy between colors and isotopic compositions

JOÃO PAULO G BARREIRA[1], WILSON T V MACHADO[2], DANIEL F. ARAÚJO[3] AND RICARDO SOARES[4]

[1]UFF - Universidade Federal Fluminense

[2]UFF - Fluminense Federal University

[3]IFREMER - Institut Français de Recherche pour l'Exploitation de la Mer

[4]INEA - State Environmental Institute

Presenting Author: jpgbarreira@gmail.com

(Post)transition metal isotope biogeochemistry has become a prominent study field, due to the recent advances in mass spectrometry techniques. In geosciences studies, metal isotopes in different sources and reservoirs provides an important perspective concerning metal pollutant source tracing, transportation, and circulation, such as Cu, Zn and Pb. However, despite its significant relevance and perspectives, this topic is not yet frequently taught in university courses and is not trivial, demanding a high abstraction capacity from learners. No published articles aim to teach the quantification of source contributions using source mixing isotope models, which is particularly important considering its potentiality for supporting emission control and remediation strategies for metal-contaminated sites. In this scenario, the present study presents a visual appealing didactic strategy regarding source mixing isotope models based on the analogy between colors (analog domain) and isotopic compositions (target domain), in order to encourage and subsidize the teaching-learning processes of this new subject in environmental geosciences and chemistry classes. We, therefore, demonstrate how familiar and relatively simple concepts can be used as effective analogies for introducing challenging subjects. . In a COVID-19 pandemic crisis period that affects in-person academic activities, the development of appealing visual approaches is imperative to engage students during remote classes. The didactic strategy proposed herein was put to the test during a remote Environmental Contamination (2020.1) class of the Postgraduation Program in Geochemistry (PPG) at the Fluminense Federal University (UFF) (Brazil). Students reported that the approach was stimulating and helped them to better visualize, understand and interpret the target domain