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Viscosity, mixing entropy, and glass-forming ability of a nuclear waste glass

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Introdução

- Curva completa de viscosidade para NWGs
- ↑JeZiCA → ↑GFA
- ↑S_{mix} → ↑GFA [1, 2]

Objetivo

- Medir a curva completa de viscosidade
- Testar a relação S_{mix} e GFA em NWGs

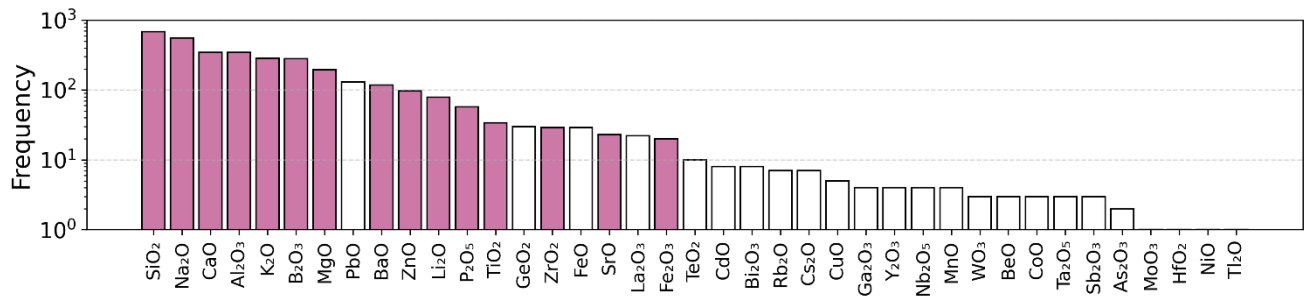
Metodologia

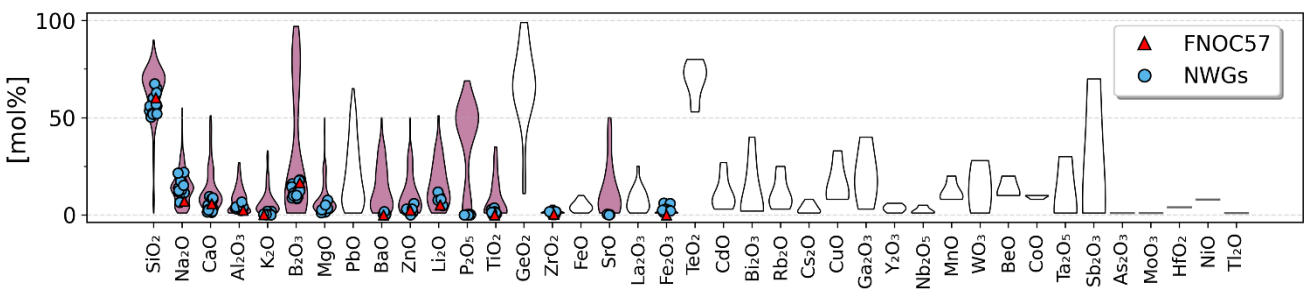
- FNOC57
- η cilindros concêntricos e micropenetração
- T_g: DSC e flash DSC
- Base de composições de NWGs
- η e T_L: GlassPy [3]
- Algoritmo genético: DEAP, restrito às faixas de óxidos de NWGs comerciais

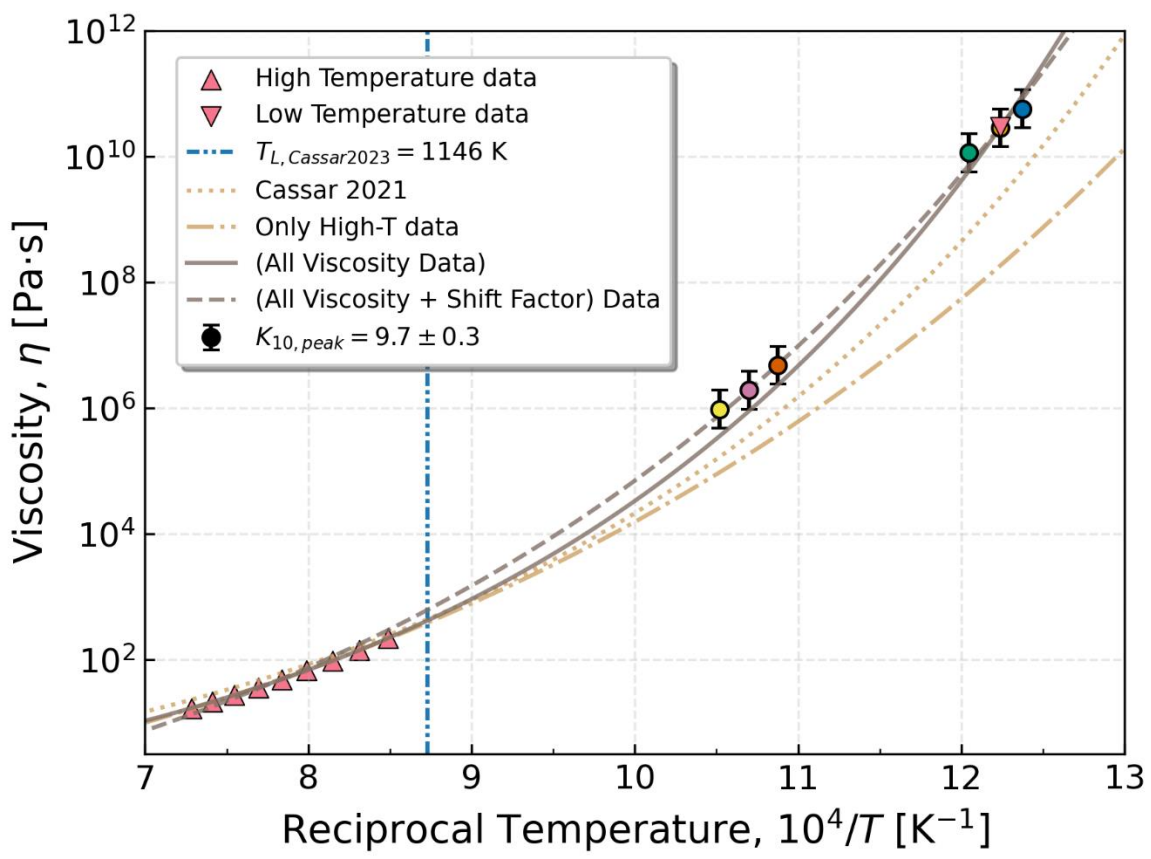
$$\mathrm{GFA} \propto \frac{\eta(T_L)}{T_L^2} = \mathrm{JeZiCA}$$

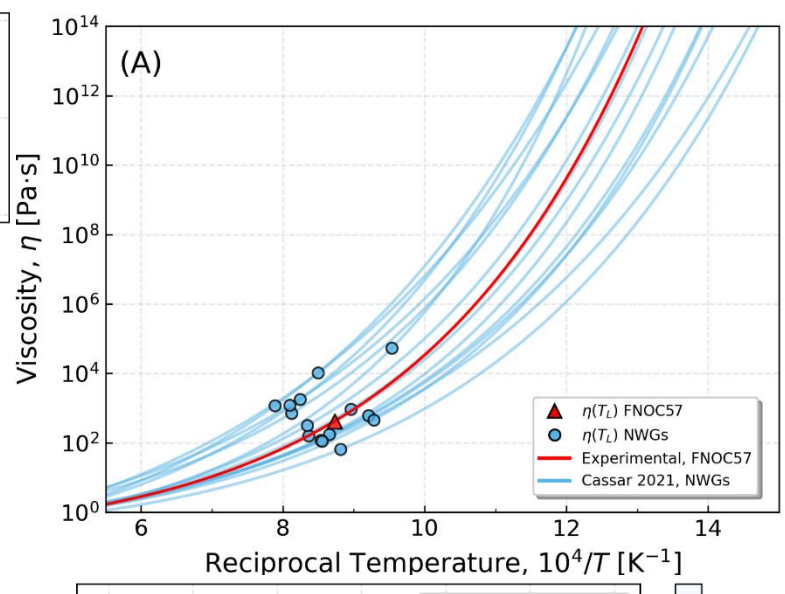
$$S_{mix} = -R \sum_{i=1}^{n} x_i \ln(x_i)$$

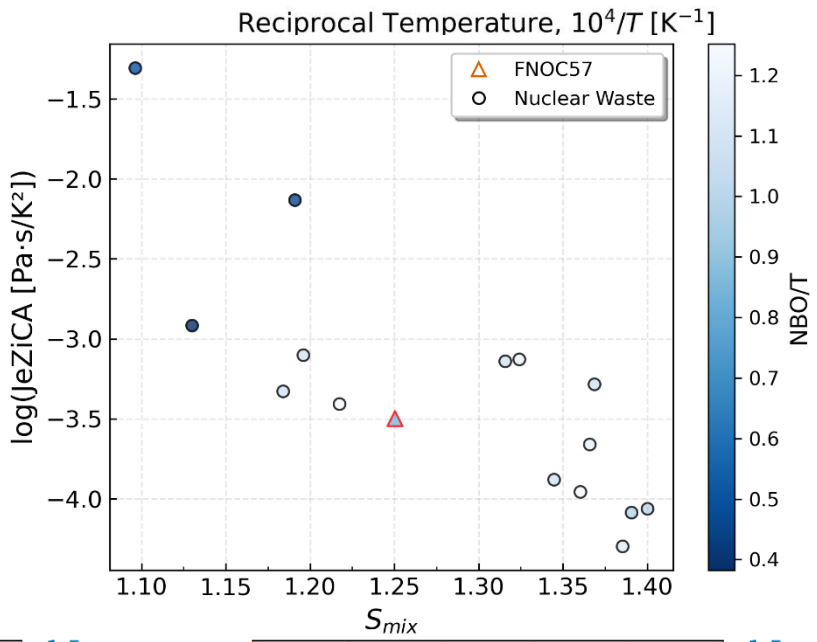
Resultados e Discussão

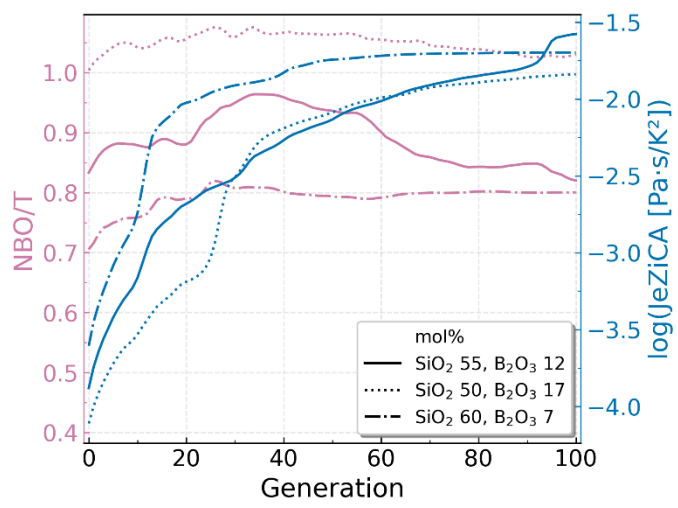


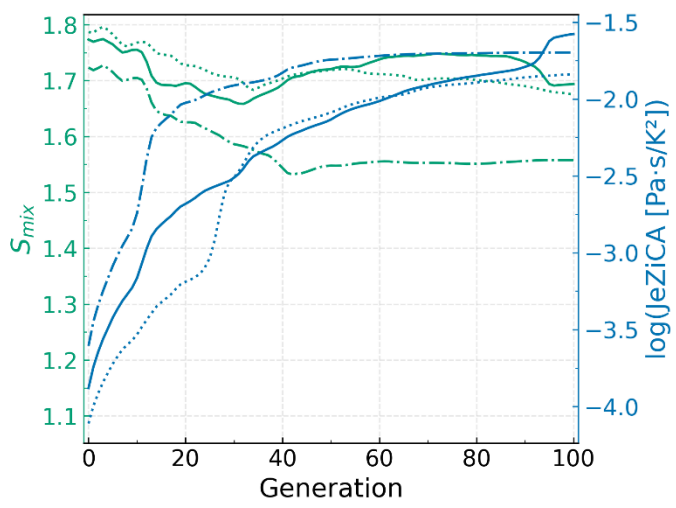


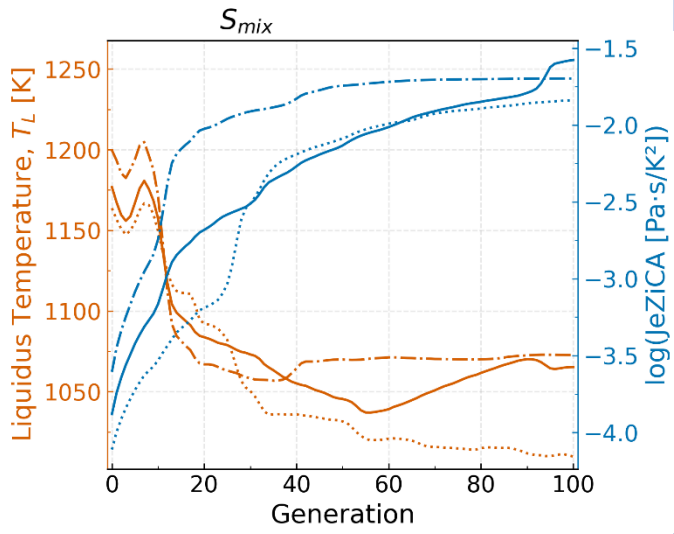












Conclusões

- ↑S_{mix} não ↑JeZiCA: S_{mix} não é fator primário da GFA em NWGs
- Curva de viscosidade completa e shift factor experimentais para a FNOC57

Referências e Agradecimentos

[1] GREER, A. L. Confusion by design. Nature, v. 366, p. 303–304, 1993

[2] ROST, C. M. et al. Entropy-stabilized oxides. Nature Communications, v. 6, art. 8485, 2015

[3] CASSAR, D. R. GlassNet: a multitask deep neural network for predicting many glass properties. Ceramics International, v. 49, p. 36013–36024, 2023

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