Dependece of morphology of a Lavaflow

rate of effusion (it defines max. length of lavaflow)

interaction between lava & environment

Physical and Chemical properties of Lava

temperature

rate of effusion

crystal & gas content

topography

Two types of Lava

Pahoeh-oe-Lava	smooth, ropy surface (create multiple flow lobes)
vs.	
Aa-Lava	rough, jagged, spiny (clinkery)

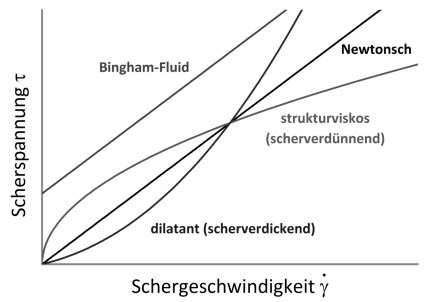
Pahoehoe-Lava:
erupted at higher temperature & therefore beeing less viscous

Aa-Lava:
tends to be more viscous but generally advances faster than Pahoehoe-Lava

Rheology / Viscosity

Shear thinning	The higher the shearstress the lower the viscosity
Shear thickening	The higher the shearstress the higher the viscosity (starch in water)
Newtonian	Stoke's Law can be applied (water, oils, air)
Non newtonian	(blood, ketchup, etc.)
Bingham	Yield stress needs to be exceeded before fluid will flow

Rheology / Viscosity



Newton Law

$\tau = \eta \cdot \dot{\gamma}$

Scheerspannung (\tau)
Dynamische Viskosität (\eta)
Scheergeschwindigkeit (\gamma)

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Not published yet.
Last updated 1st September, 2022.
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