Training step: 10k, Validation Perplexity: 15.02 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

Training step: 20k, Validation Perplexity: 14.36 out of 21 Hydrophobic Polar Medium (120-150 Da)

Biological property

- Negatively charged
- Positively charged
- Aromatic
- Unique

- Small (<120 Da)
- Large (>150 Da)

Training step: 30k, Validation Perplexity: 13.93 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

Training step: 40k, Validation Perplexity: 13.75 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

Training step: 50k, Validation Perplexity: 13.46 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

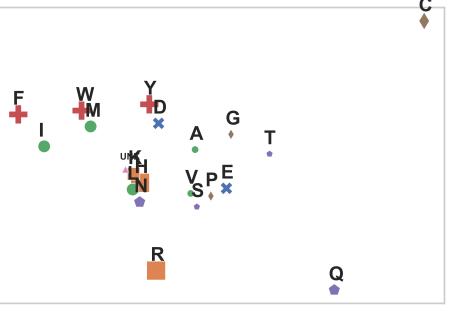
Training step: 60k, Validation Perplexity: 13.22 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

Training step: 70k, Validation Perplexity: 13.08 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

Training step: 80k, Validation Perplexity: 12.99 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) R Medium (120-150 Da) Large (>150 Da)

Training step: 90k, Validation Perplexity: 12.85 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

# Training step: 100k, Validation Perplexity: 12.76 out of 21



Biological property

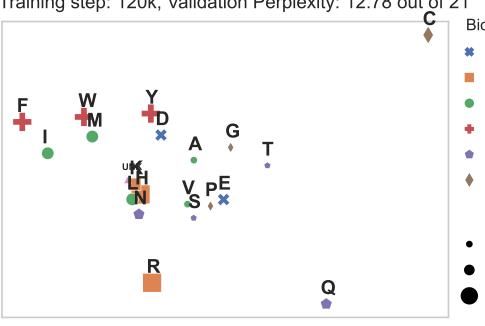
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

- Size Small (<120 Da)
- Medium (120-150 Da)

Large (>150 Da)

Training step: 110k, Validation Perplexity: 12.75 out of 21 Biological property Negatively charged Positively charged Hydrophobic Aromatic Polar Unique Size Small (<120 Da) Medium (120-150 Da) Large (>150 Da)

#### Training step: 120k, Validation Perplexity: 12.78 out of 21



Biological property

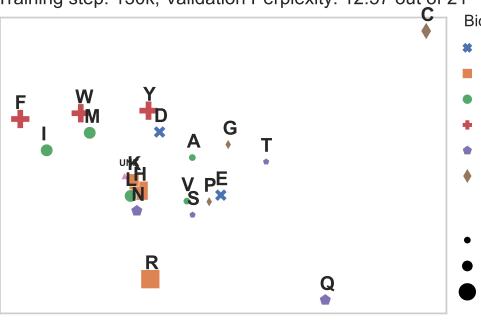
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
- Polar

Unique

- Size
- Small (<120 Da)
- Medium (120-150 Da)

Large (>150 Da)

### Training step: 130k, Validation Perplexity: 12.57 out of 21



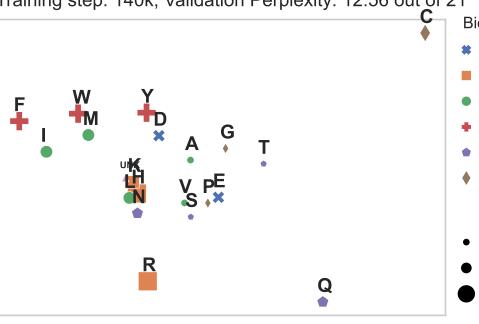
Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
- Polar

Unique

- Size
- Small (<120 Da)
- Medium (120-150 Da)
- Large (>150 Da)

## Training step: 140k, Validation Perplexity: 12.56 out of 21



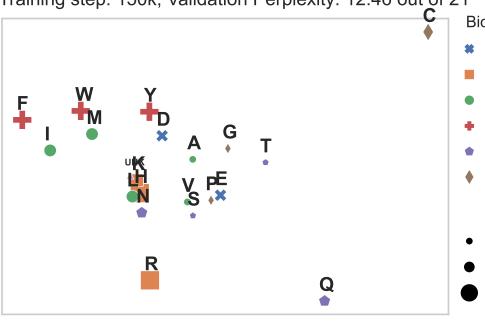
Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

Small (<120 Da)

- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 150k, Validation Perplexity: 12.46 out of 21

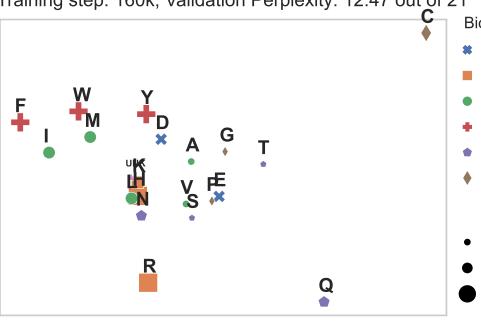


Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
- Polar
- Unique

- Small (<120 Da)
- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 160k, Validation Perplexity: 12.47 out of 21



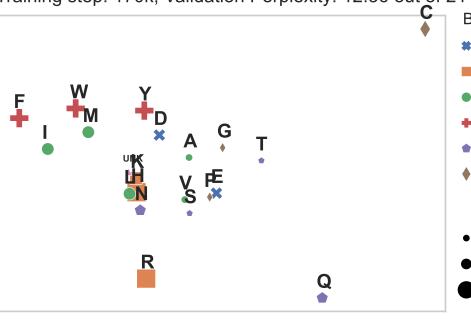
Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

Small (<120 Da)

- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 170k, Validation Perplexity: 12.36 out of 21



Biological property

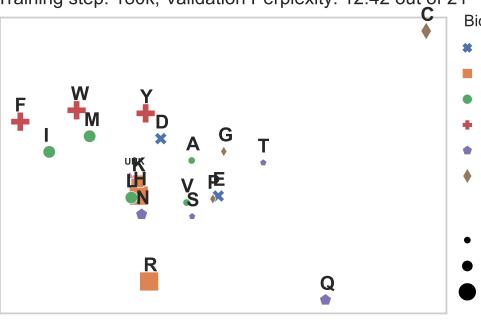
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
  Polar
- Unique

'

• Small (<120 Da)

- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 180k, Validation Perplexity: 12.42 out of 21

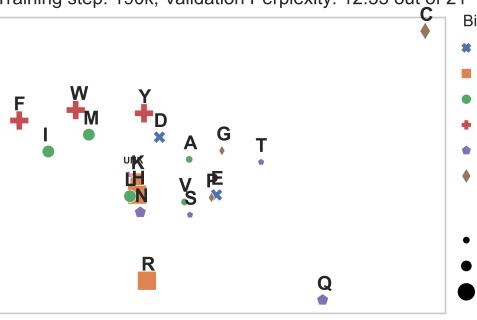


Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
- Polar
- Unique

- Small (<120 Da)
- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 190k, Validation Perplexity: 12.35 out of 21

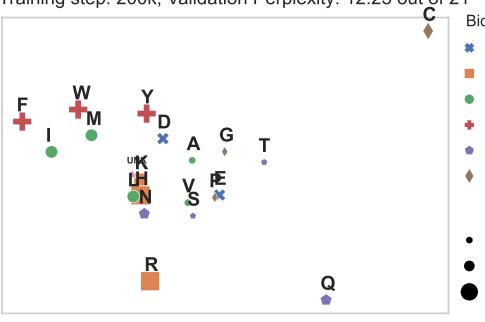


Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
- Polar
- Unique

- Small (<120 Da)</li>
- Medium (120-150 Da)
- Large (>150 Da)

#### Training step: 200k, Validation Perplexity: 12.25 out of 21



Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
  Polar
- Unique

51...45.5

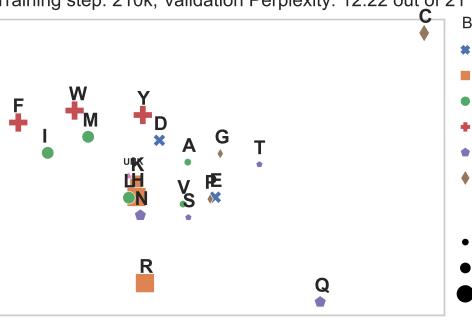
Small (<120 Da)

Size

- 3111all (~120 Da)
- Medium (120-150 Da)

Large (>150 Da)

# Training step: 210k, Validation Perplexity: 12.22 out of 21



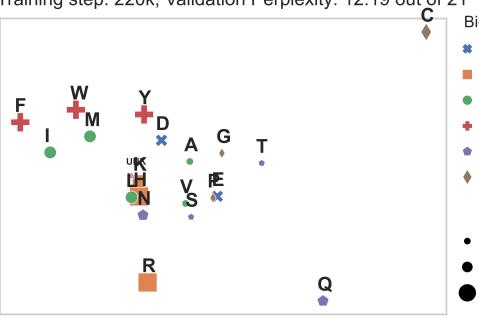
Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

Small (<120 Da)

- Medium (120-150 Da)
- Large (>150 Da)

## Training step: 220k, Validation Perplexity: 12.19 out of 21



Biological property

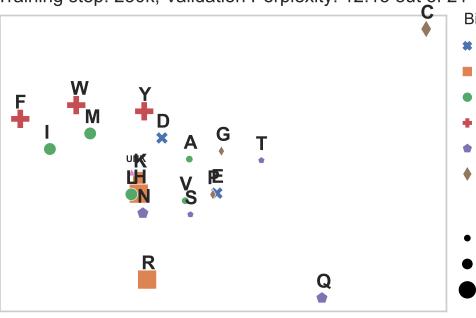
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

- Small (<120 Da)
- Medium (120-150 Da)

Size

Large (>150 Da)

## Training step: 230k, Validation Perplexity: 12.15 out of 21



Biological property

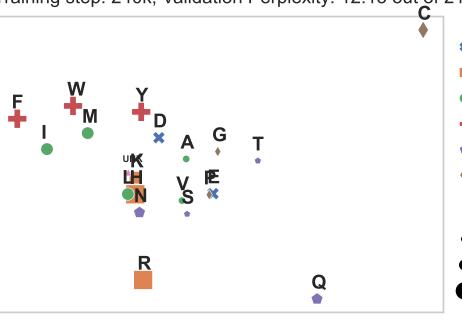
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
  Polar
- Unique

•

• Small (<120 Da)

- Medium (120-150 Da)
  - Large (>150 Da)

# Training step: 240k, Validation Perplexity: 12.13 out of 21

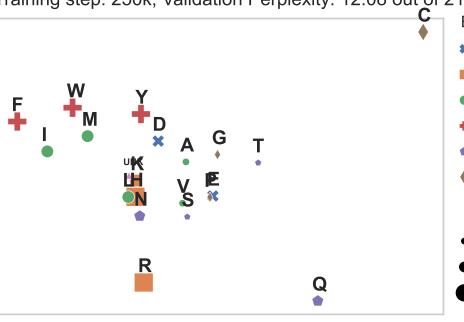


Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

- Size Small (<120 Da)
- Medium (120-150 Da)
  - Large (>150 Da)

# Training step: 250k, Validation Perplexity: 12.08 out of 21



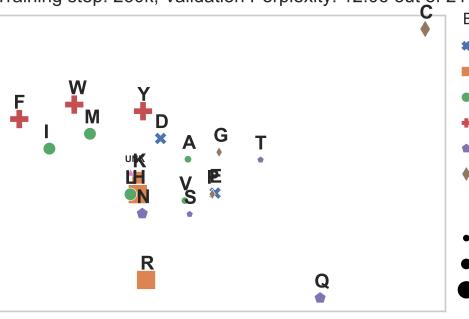
Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

Small (<120 Da)

- Medium (120-150 Da)
- Large (>150 Da)

## Training step: 260k, Validation Perplexity: 12.06 out of 21



Biological property

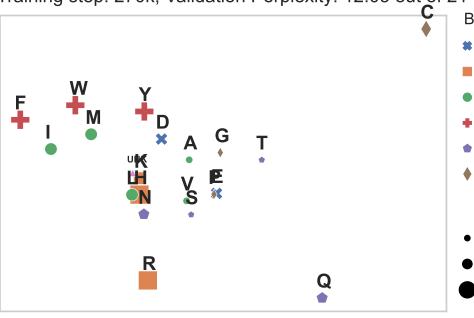
- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
  Polar
- Unique

5...45.5

• Small (<120 Da)

- Medium (120-150 Da)
  - Large (>150 Da)

# Training step: 270k, Validation Perplexity: 12.05 out of 21



Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic
  Polar
- Unique

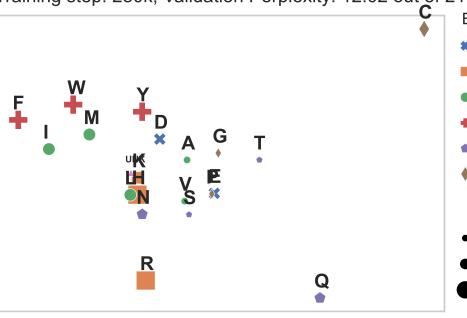
2...40.0

• Small (<120 Da)

- Siliali (<120 Da)
  - Medium (120-150 Da)

    Large (>150 Da)

# Training step: 280k, Validation Perplexity: 12.02 out of 21



Biological property

- Negatively charged
- Positively charged
- Hydrophobic
- Aromatic Polar
- Unique

Small (<120 Da)

- - Medium (120-150 Da) Large (>150 Da)