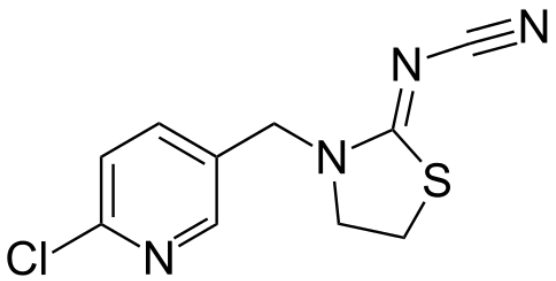
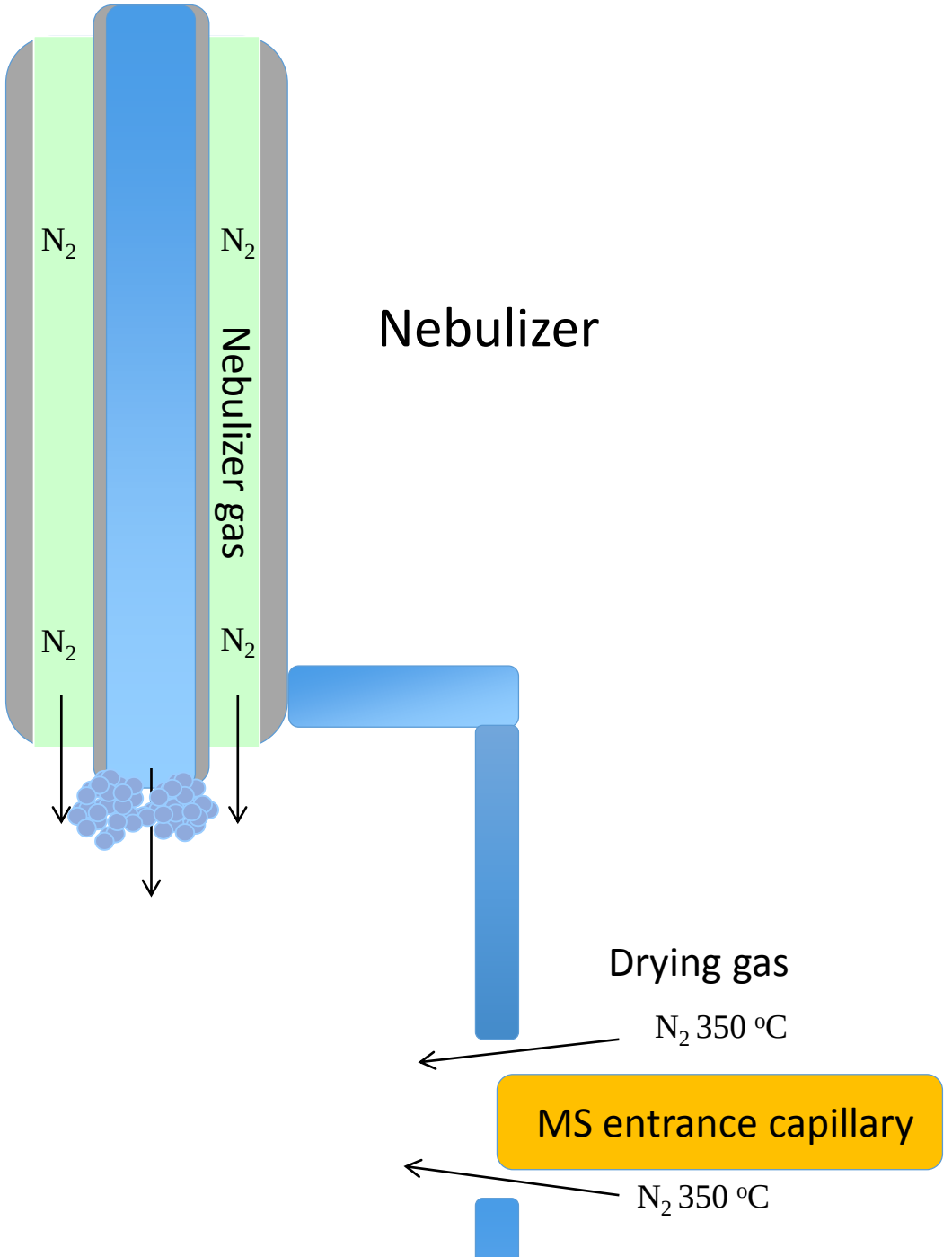
Experimental design



Thiacloprid



Method parameters:

Nebulizer gas pressure

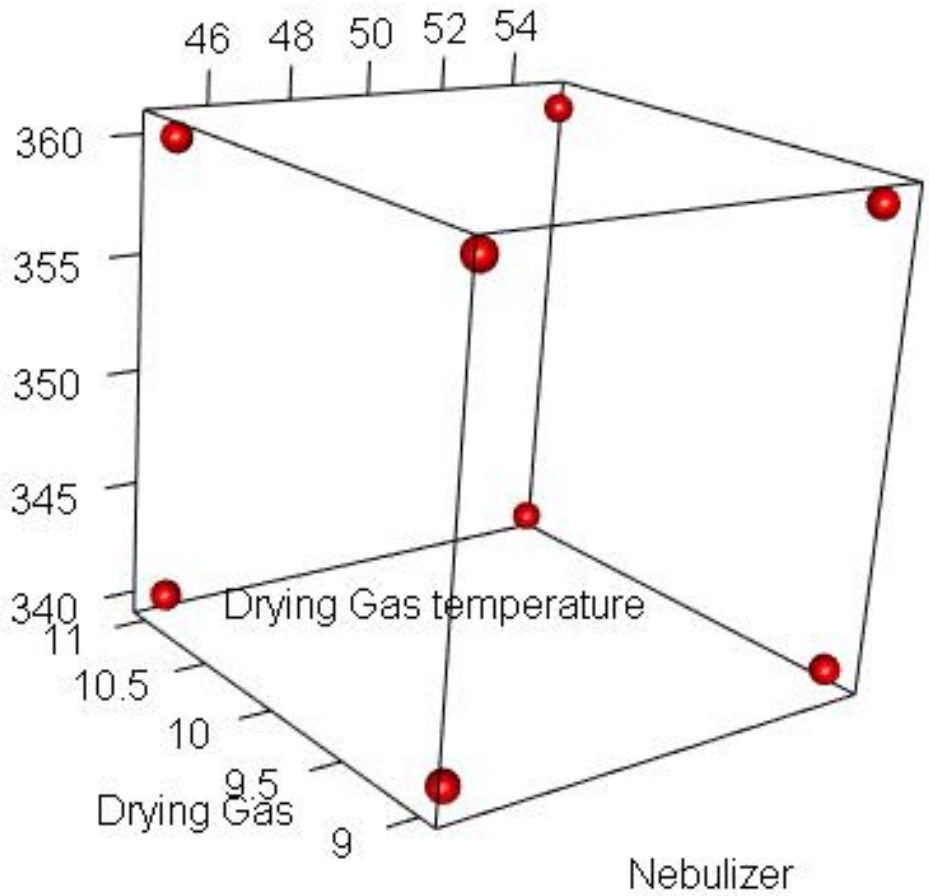
50 psi ±5 psi

Drying gas flow rate

10 l/min ±1 l/min

Drying gas temperature

350 °C ±10 °C



Full-factorial design

Method parameters:

Nebulizer gas pressure

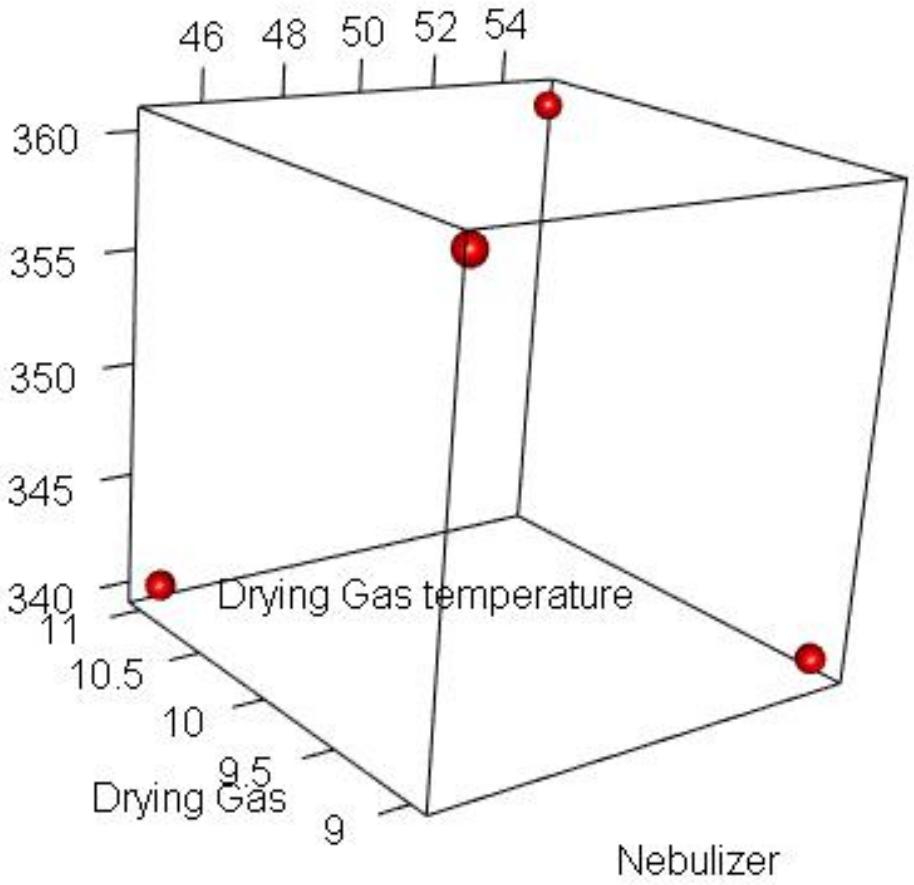
50 psi ±5 psi

Drying gas flow rate

10 l/min ±1 l/min

Drying gas temperature

350 °C ±10 °C



Fractional factorial design

Nebulizer gas (psi)	Drying gas (l/min)	Drying gas temp (°C)
45	9	360
45	11	340
55	9	340
55	11	360

Nebulizer gas (psi)	Drying gas (l/min)	Drying gas temp (°C)	Peak Area$_{thiacloprid}$
45	9	360	$1.1 \cdot 10^8 = S_1$
45	11	340	$1.2 \cdot 10^8 = S_2$
55	9	340	$1.0 \cdot 10^8 = S_3$
55	11	360	$1.3 \cdot 10^8 = S_4$

$$\text{Nebulizer Effect} = \frac{S_3 + S_4}{2} - \frac{S_1 + S_2}{2} = 1\%$$

Repeatability limit 5%

Nebulizer gas (psi)	Drying gas (l/min)	Drying gas temp (°C)
45	9	360
45	11	340
55	9	340
55	11	360

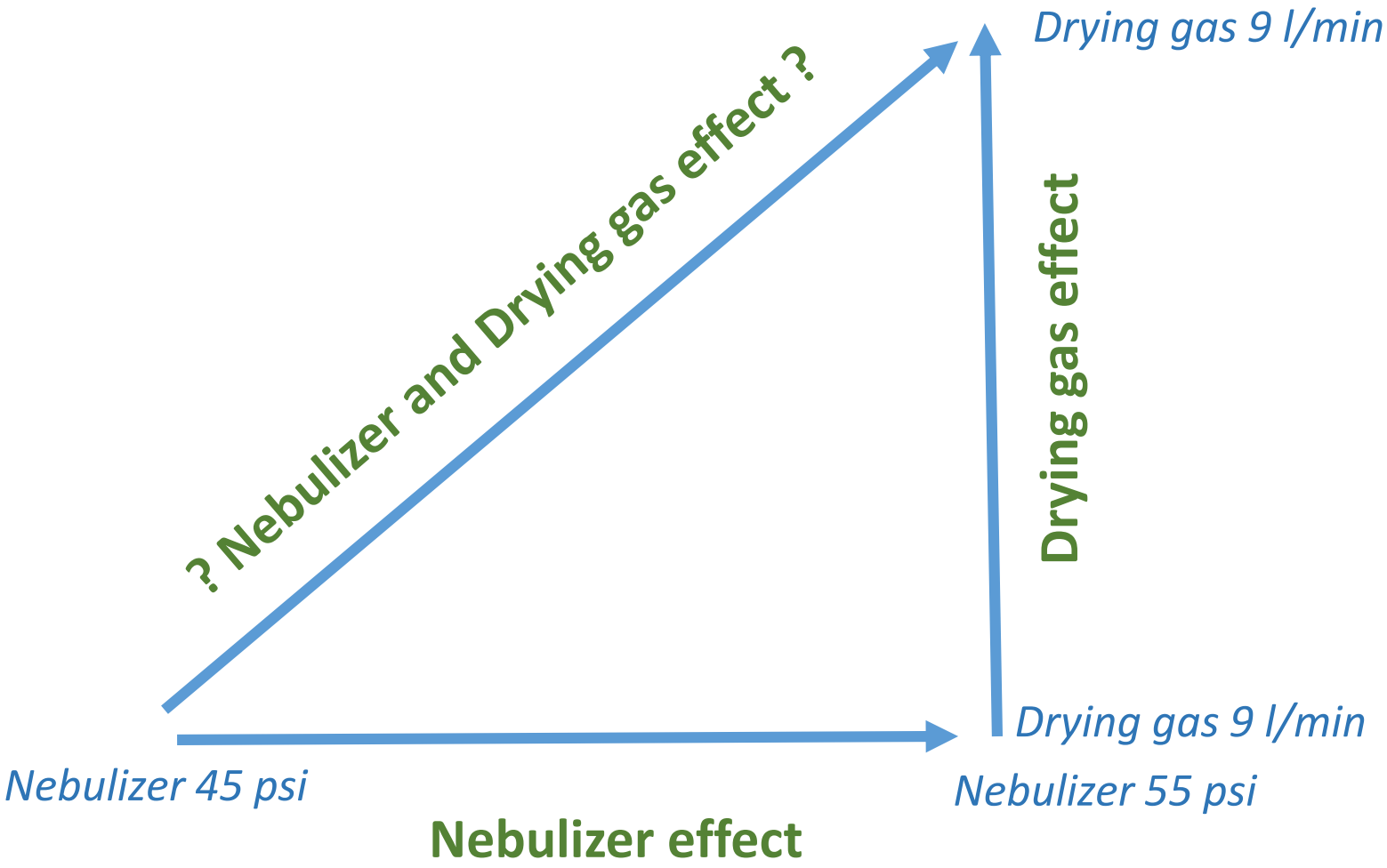
Nebulizer gas (psi)	Drying gas (l/min)	Drying gas temp (°C)	Peak Area$_{thiacloprid}$
45	9	360	$1.1 \cdot 10^8 = S_1$
55	9	340	$1.0 \cdot 10^8 = S_2$
45	11	340	$1.2 \cdot 10^8 = S_3$
55	11	360	$1.3 \cdot 10^8 = S_4$

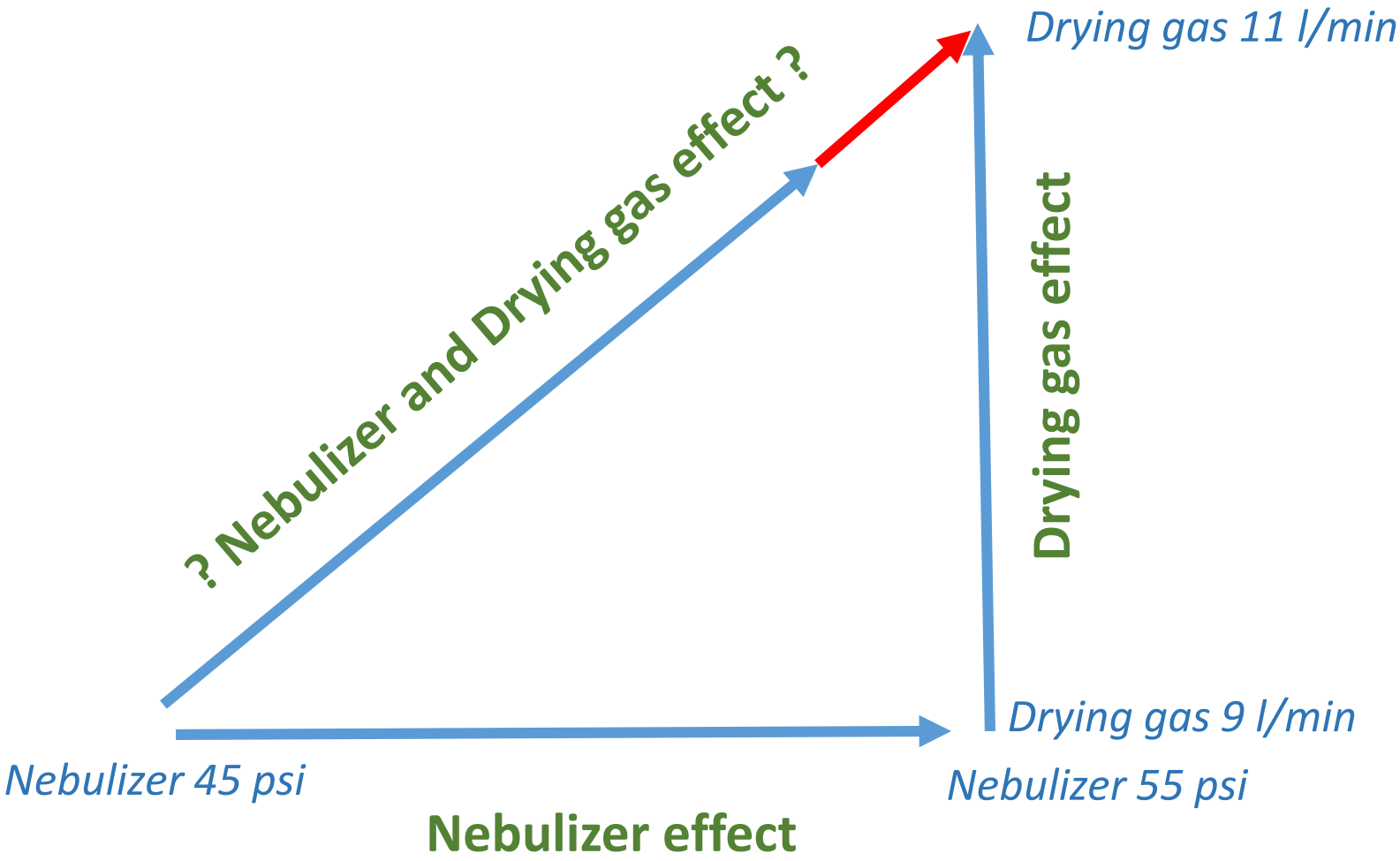
$$\text{Drying Gas Effect} = \frac{S_3 + S_4}{2} - \frac{S_1 + S_2}{2} = 17\%$$

Parameter interactions

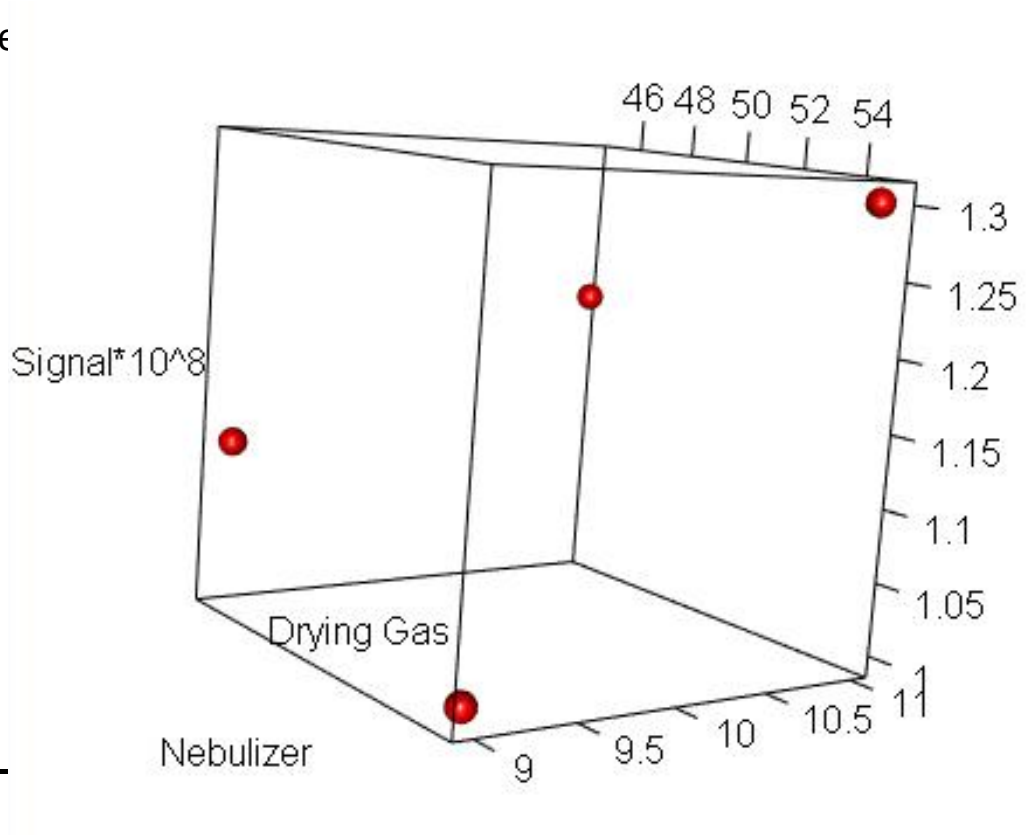
Nebulizer gas (psi)	Drying gas (l/min)	Drying gas temp (°C)
45	9	360
45	11	340
55	9	340
55	11	360

Nebulizer gas (psi)	Drying gas (l/min)	Neb.gas x D. gas
-	-	+
-	+	-
+	-	-
+	+	+

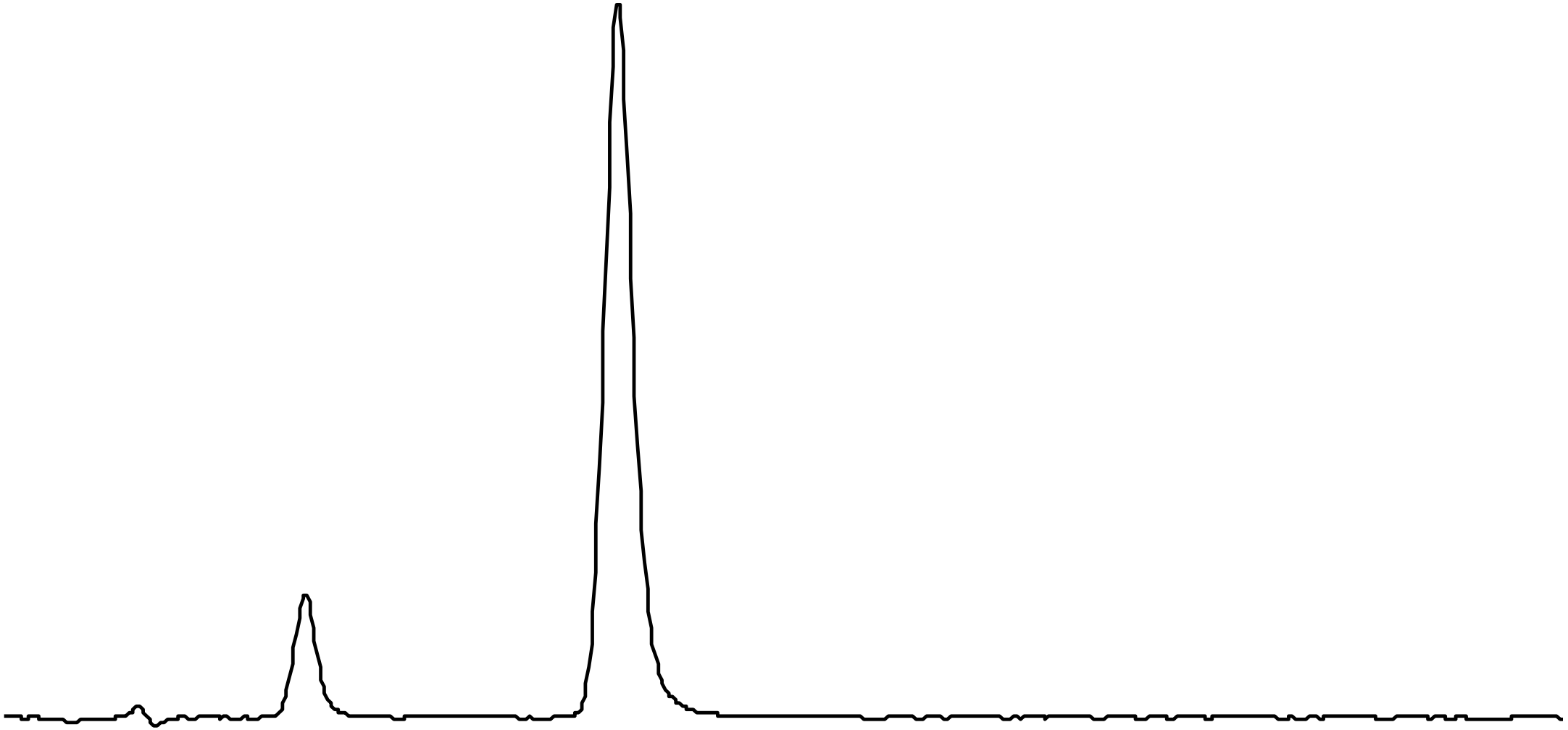

Drying gas 9 l/min
? Nebulizer and Drying gas effect ?
Drying gas effect
Drying gas 9 l/min
Nebulizer 45 psi
Nebulizer 55 psi
Nebulizer effect


Drying gas 11 l/min
? Nebulizer and Drying gas effect ?
Drying gas effect
Drying gas 9 l/min
Nebulizer 45 psi
Nebulizer 55 psi
Nebulizer effect

Nebulizer gas (psi)	Drying gas (l/min)	Neb.gas x D. gas	Re
45	9	+	
55	9	-	
45	11	-	
55	11	+	



$$\text{Neb. gas x D. gas Effect} = \frac{S_1 +}{2}$$



Experimental design