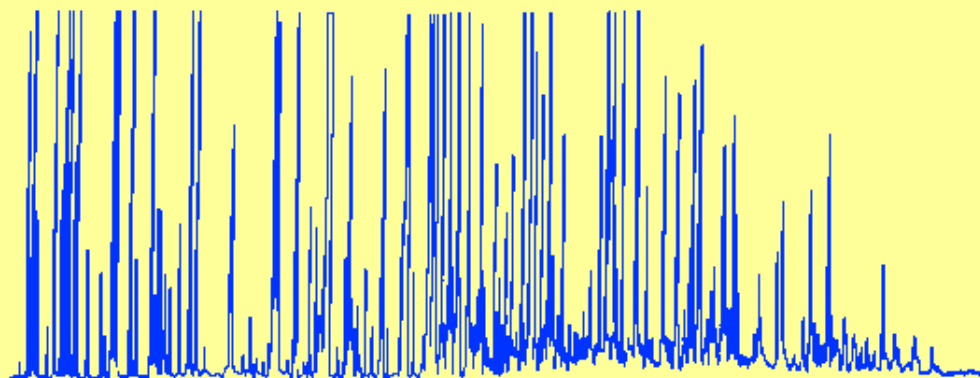




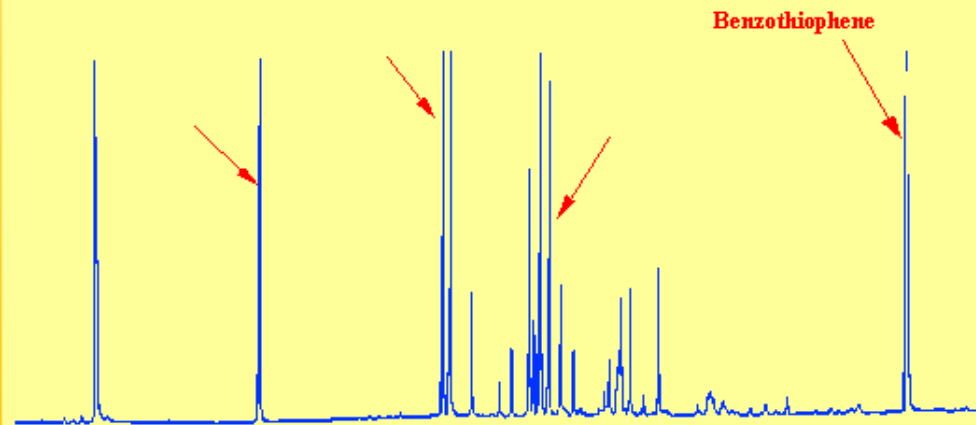
ӘЛ-ФАРАБИ АТЫНДАҒЫ ҚАЗАҚ ҰЛТТЫҚ УНИВЕРСИТЕТІ

Detectors in gas chromatography

Detectors in chromatography



Universal detector



Selective detector

Flame ionization detector

The **F**lame Ionization Detector

Electron capture detector



**Electron
Capture
Detector**

Detector Comparison

Detector	Type	Selectivity	Sensitivity	Linear range
FID	Universal	-	10 pg C	10^7
ECD	Selective	Halogenated compounds	0,2 pg Cl	10^4
NPD	Selective	Nitrogen- and phosphorus-containing compounds	1 pg N, 5 pg P	10^4
PID	Selective	Aromatic hydrocarbons		10^7
IR	Selective	Any IR absorbing compounds	1 ng	10^3
MSD	Selective	Characteristic ions	1 pg	10^5

Task

What detection limit of toluene can be achieved when determining it in air by gas chromatography with flame ionization detection, if it is known that the volume of the injected sample is 10 μl .

Solution

Detector sensitivity – 10 pg

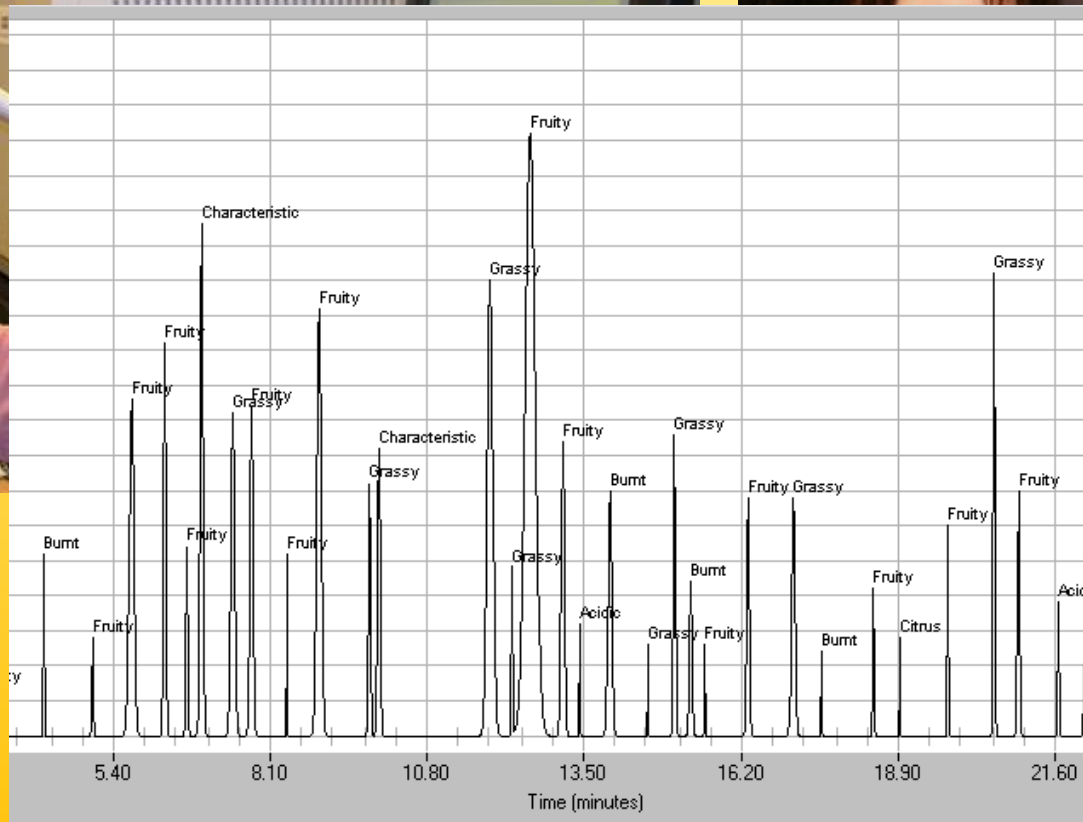
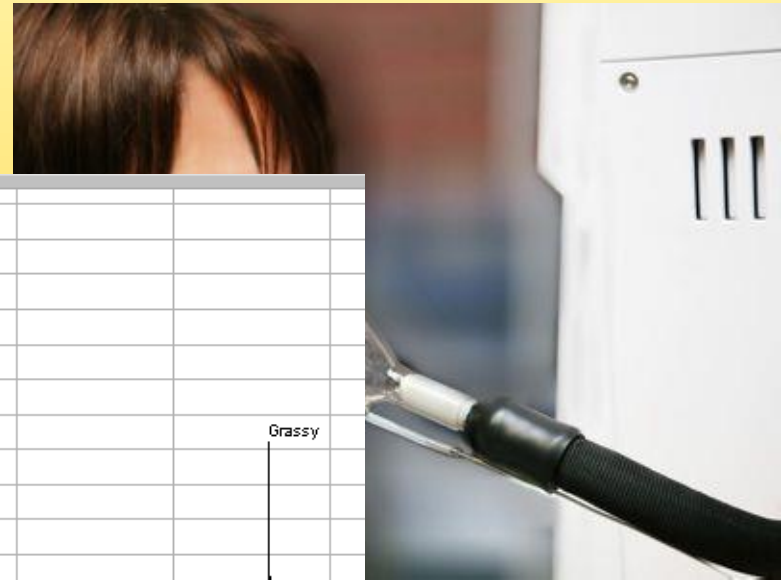
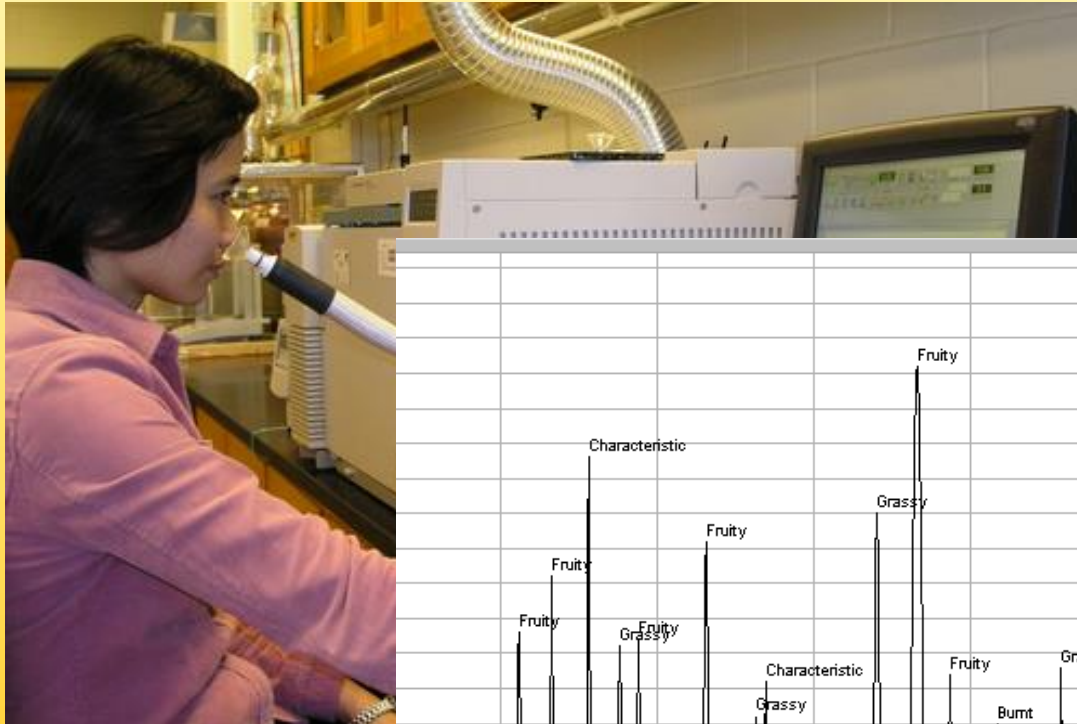
$$\text{LOD} = 10 \text{ pg} / 10 \mu\text{L} = 1 \text{ pg} / \mu\text{L} = 1 \text{ mg/m}^3$$

Question

Какой объем воздуха необходимо ввести в газовый хроматограф для достижения предела обнаружения толуола 10 мкг/м^3 ?

How much air must be introduced into the gas chromatograph to reach the detection limit of $10 \text{ }\mu\text{g/m}^3$ of toluene?

Olfactometric Detector



Characteristic odor caused by separated sample compounds

Odor
Characteristic

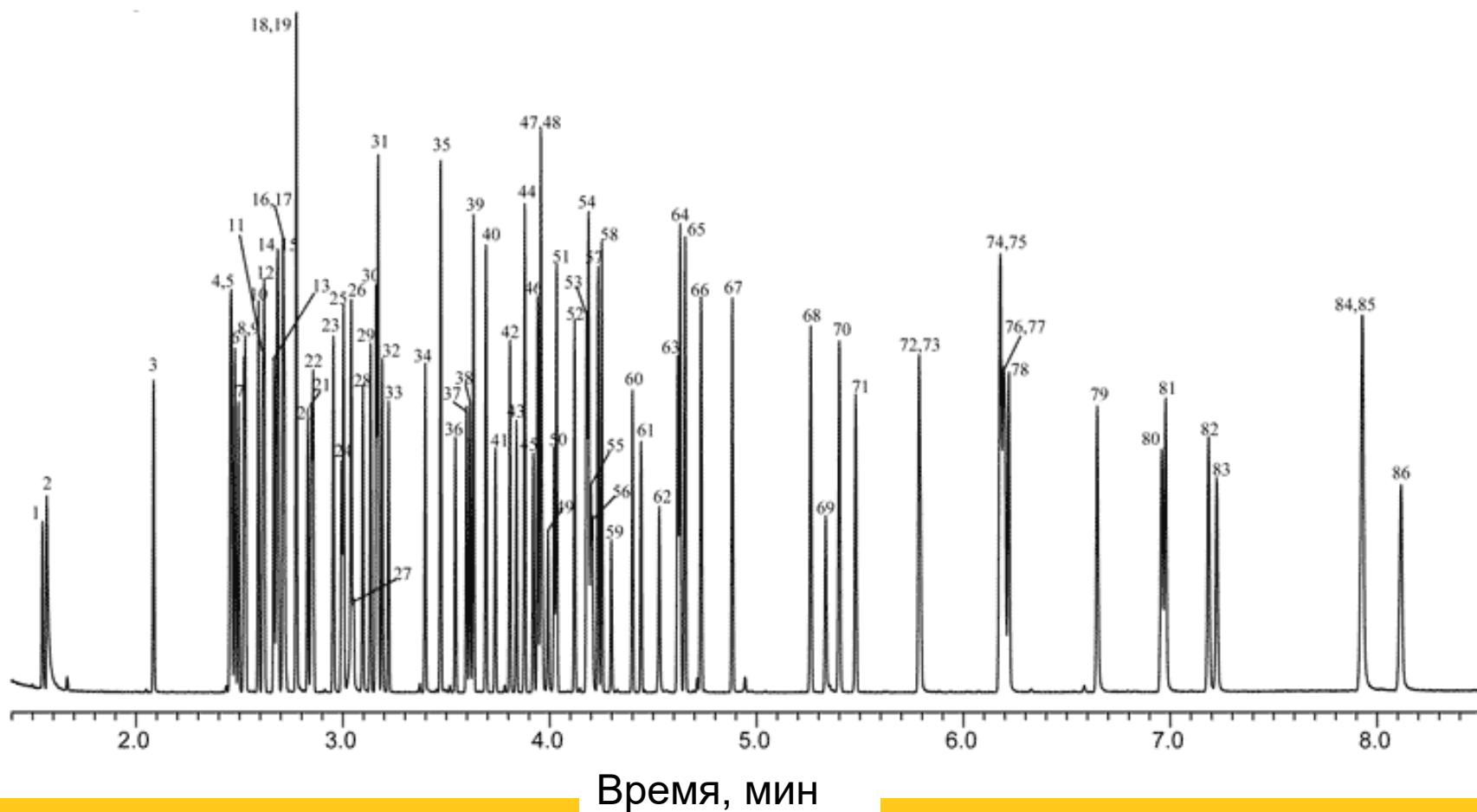
Hedonic tone

Odor Intensity



Chromatogram

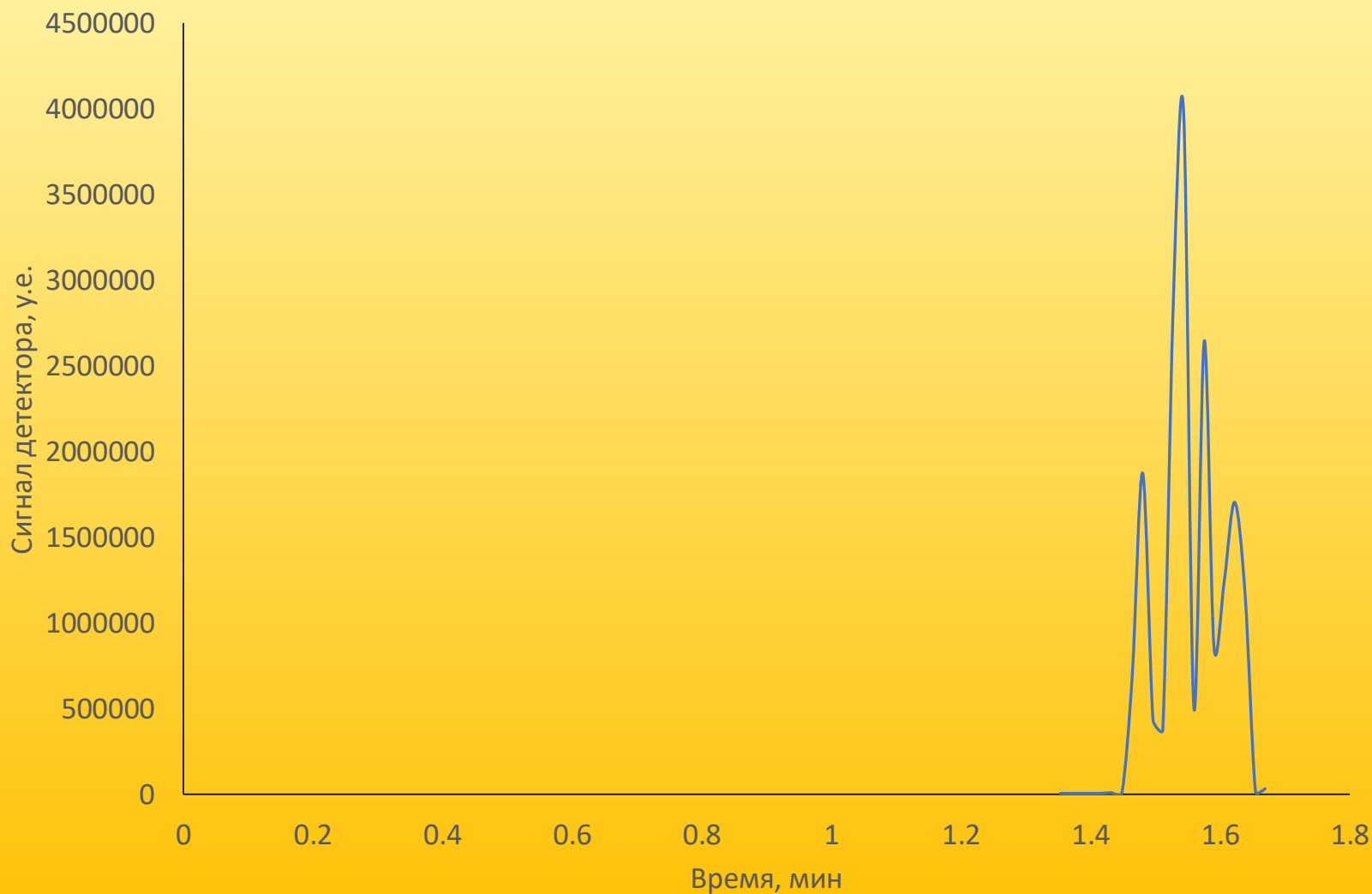
Сигнал детектора



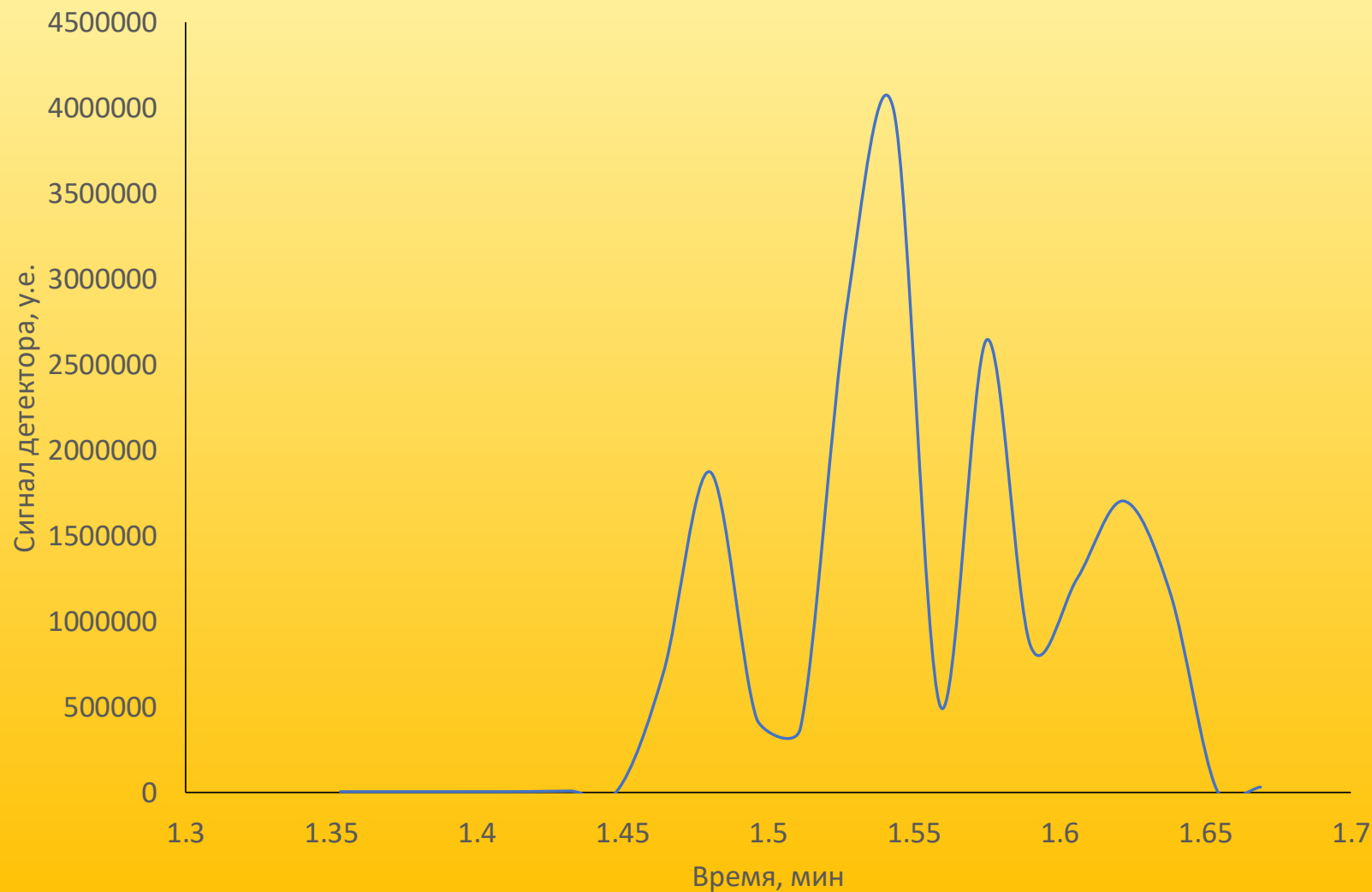
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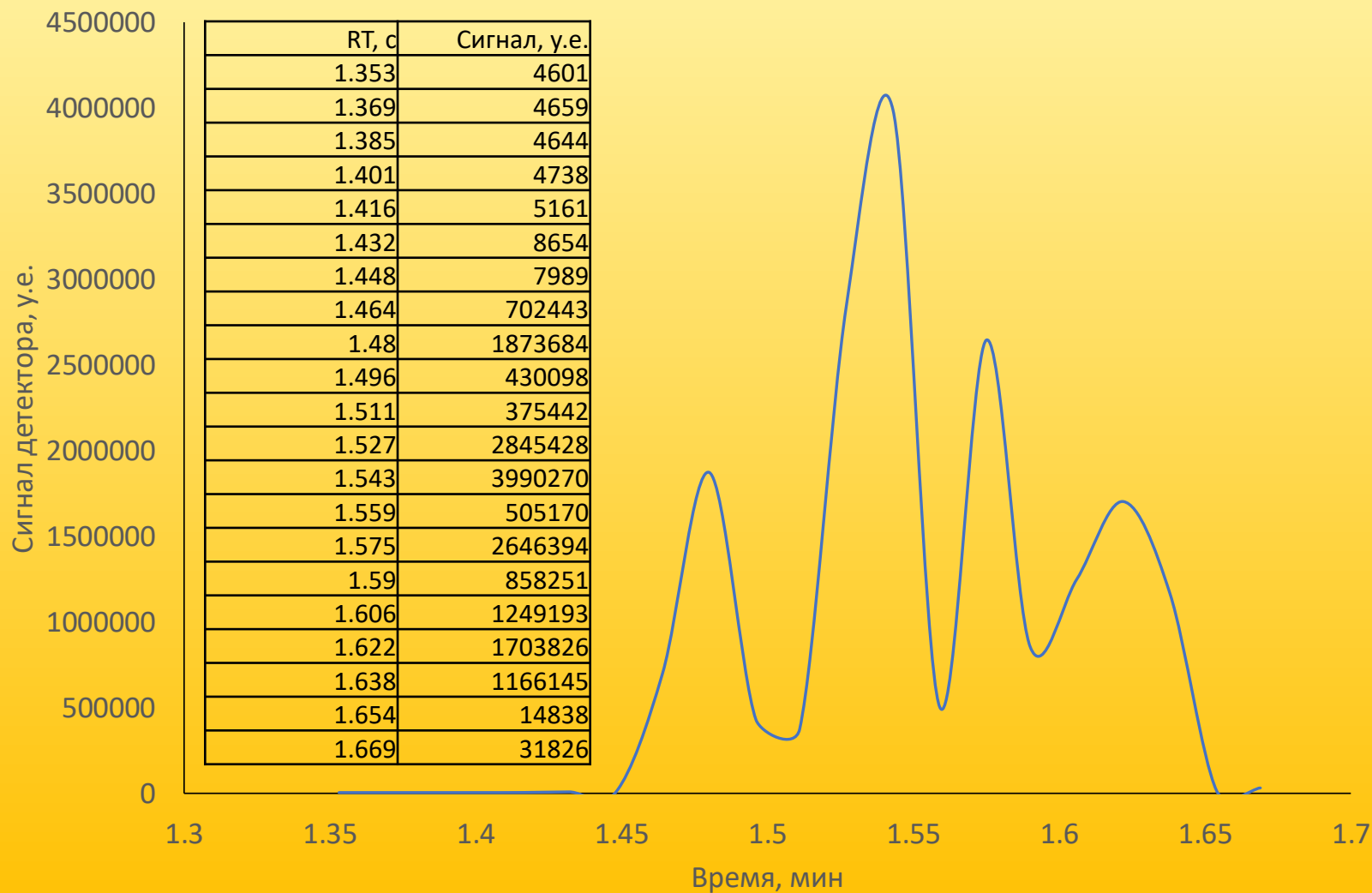
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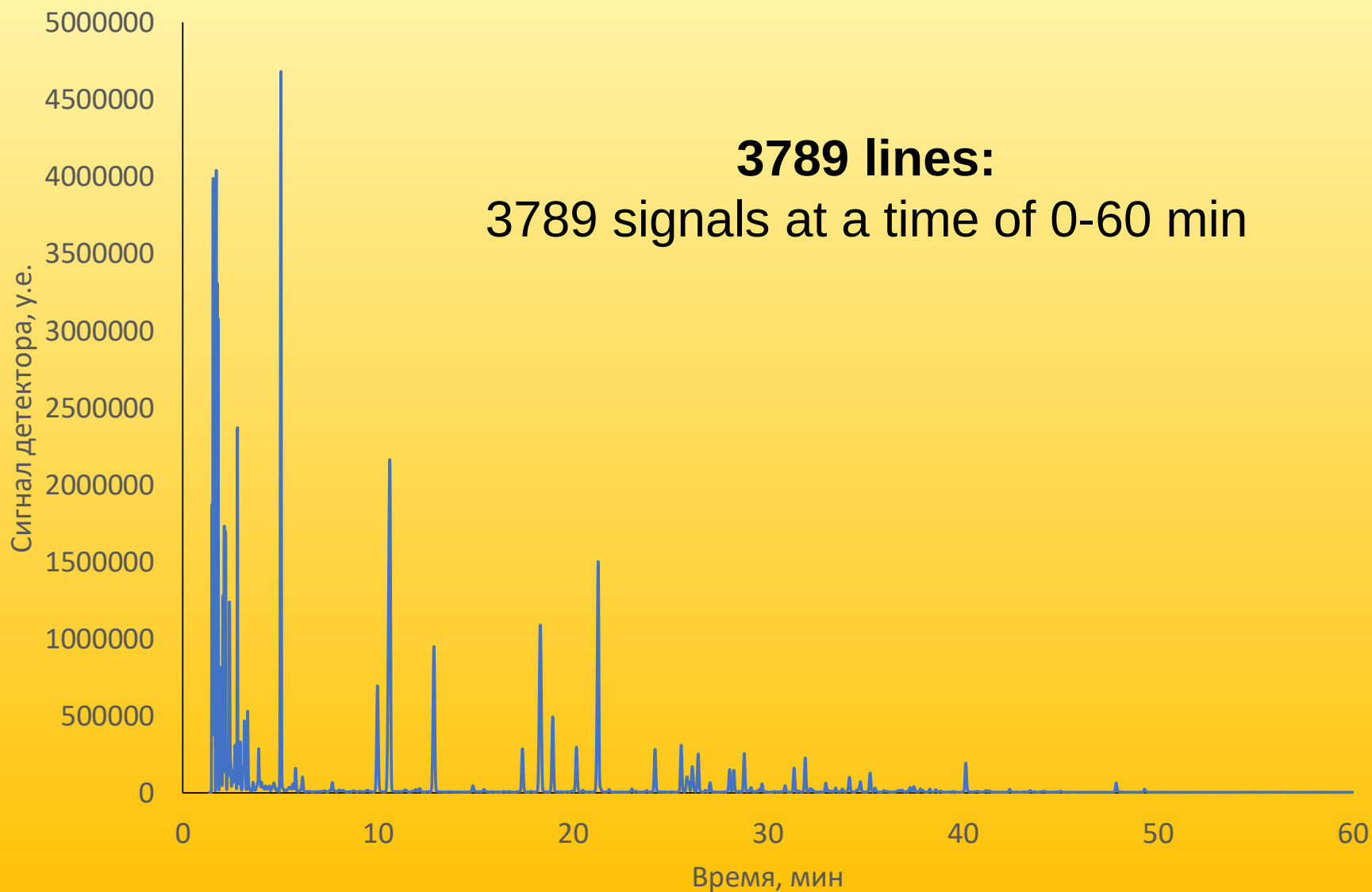
Chromatogram fragment



Chromatogram fragment



Whole chromatogram



Peak and its processing

