

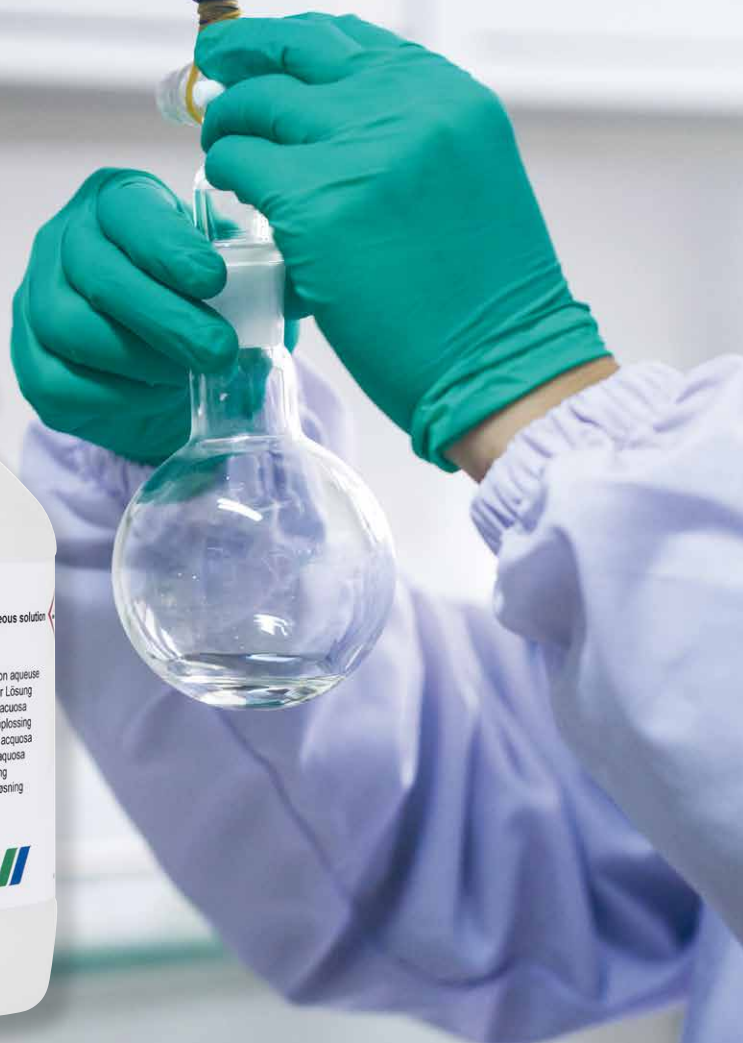
# VWR® NITROGEN DETERMINATION ACCORDING TO KJELDAHL

Kjeldahl catalysts range

Acids for digestion

Alkalis and ready to use  
solutions for neutralisation  
and distillation

Volumetric solutions for  
direct and back titration



# Nitrogen determination according to Kjeldahl is easier with VWR!

- Wide range of catalysts available
- Different sizes of tablet available from 1 to 5 g
- Easy to use tablet format

## Kjeldahl catalysts

More than 130 years ago, Johan Kjeldahl, a research analyst from the Carlsberg Breweries in Denmark, developed a method for the determination of nitrogen in samples of biological origin, i.e. plants and animals. This method is still used in thousands of laboratories in Food and Beverage companies for the analysis of proteins, nitrates, nitrites and other nitrogenated molecules. Kjeldahl nitrogen determinations are performed on a variety of substances such as meat, feed, grain, milk, wastewater and other samples.

### The Kjeldahl method maybe broken down in 3 main steps

- Digestion
- Distillation
- Titration

Kjeldahl digestion converts nitrogen compounds (proteins, amines, organic compounds) into ammonia compounds. Free ammonia is released by the addition of caustics, which is then expelled by distillation and subsequently titrated. Kjeldahl catalyst tablets accelerate this reaction.



Today, for your convenience, VWR offers a comprehensive range of 'ready to use' tablets to meet the optimal requirements for the sulphuric acid decomposition phase. This wide range is composed of 20 standard items in different tablet sizes, in a boxes of 100 or 1000 tablets.

Catalyst type	Composition								Tablet size (g)	Cat. No. 100 tbs	Cat. No. 1000 tbs
	K <sub>2</sub> SO <sub>4</sub>	Na <sub>2</sub> SO <sub>4</sub>	CuSO <sub>4</sub>	CuSO <sub>4</sub> , 5H <sub>2</sub> O	TiO <sub>2</sub>	Se	Silicon antifoams	Aids			
Kjeldahl Catalyst free of mercury and selenium	23,10%	69,30%	1,80%		2,80%			3,00%	3,5	85539.0100	85539.1000
Kjeldahl Catalyst free of mercury and selenium	23,10%	69,30%	1,80%		2,80%			3,00%	5	85540.0100	85540.1000
Kjeldahl Catalyst Missouri	48,30%	48,40%	0,30%					3,00%	5	85541.0100	85541.1000
Kjeldahl Catalyst Wieninger		96,25%	1,50%				1,50%	0,75%	3,5	85542.0100	85542.1000
Kjeldahl Catalyst Wieninger		96,25%	1,50%				1,50%	0,75%	5	85543.0100	85543.1000
Kjeldahl Catalyst PS	100%								5	85544.0100	85544.1000
Kjeldahl Catalyst CX	90,91%			9,09%					5,5	85525.0100	85525.1000
Kjeldahl Catalyst CT	94,34%			2,83%	2,83%				5,3	85526.0100	85526.1000
Kjeldahl Catalyst C	98,04%			1,96%					5,1	85527.0100	85527.1000
Kjeldahl Catalyst TCT	94,34%			2,83%	2,83%				3,71	85528.0100	85528.1000
Kjeldahl Catalyst CK	89,74%			10,26%					3,9	85529.0100	85529.1000
Kjeldahl Catalyst ST	99,9%						0,1%		3,5	85530.0100	85530.1000
Kjeldahl Catalyst CTQ	94,34%			2,83%	2,83%				1,59	85531.0100	85531.1000
Kjeldahl Catalyst Antifoam		97,0%						3,0%	1	85532.0100	85532.1000
Kjeldahl Catalyst NAS		95,24%					4,76%		1,05	85533.0100	85533.1000
Kjeldahl Catalyst S	99,9%						0,1%		5,005	85534.0100	85534.1000
Kjeldahl Catalyst KS	99,01%						0,99%		5,05	85535.0100	85535.1000
Kjeldahl Catalyst W K150	97,50%			1,50%			1,00%		5	85536.0100	85536.1000
Kjeldahl Catalyst IB61	93,46%			5,62%			0,92%		5	85537.0100	85537.1000
Kjeldahl Catalyst AB04	99,95%			0,05%					5,025	85538.0100	85538.1000

## AnalaR NORMAPUR® acids for digestion

Analytical grade reagents – guaranteed specifications for every batch ensuring consistency and reliability.

Acid	Concentration	Grade	Pk	
			1 l	2,5 l
Hydrochloric	37%	AnalaR NORMAPUR® Reag. Ph. Eur.	20252.295	20252.335
	32%	AnalaR NORMAPUR®	20254.310	20254.401
	25%	AnalaR NORMAPUR®	20257.310	20257.401
	98%	AnalaR NORMAPUR®	102765G	102766H
Sulphuric	97%	AnalaR NORMAPUR® for nitrogen determination	85546.290	85546.320
	95%	AnalaR NORMAPUR®	20700.290	20700.320
Anti-bumping granules (250 g)			330093Y	



## Alkalis and ready to use solutions for neutralisation and distillation

Substance	Description	Pk			
		1 l or 1 kg	2,5 l	5 l	10 l
Boric acid	AnalaR NORMAPUR®	20185.297	-	20185.360	-
	2% solution	-	-	2733.5000	-
	4% solution	-	-	5792.5000	-
	4% solution with indicator pH 4,5	-	192316H	-	-
	4% solution with indicator	-	-	95097.5000	-
Sodium hydroxide	AnalaR NORMAPUR® ACS, Reag. Ph. Eur.	28244.295	-	28244.364	-
	50% (w/w) solution GPR RECTAPUR®	-	84522.320	-	-
	50% (w/w) solution GPR RECTAPUR®	191543M	-	191546P	-
	35% (w/w) solution GPR RECTAPUR®	28224.296	-	28224.365	-
	32% (w/w) solution AnalaR NORMAPUR® for nitrogen determination	28225.290	28225.324	28225.360	28225.415
	32% (w/w) solution GPR RECTAPUR® for nitrogen determination	-	-	9913.5000	9913.9010
	30% (w/w) solution 40% w/v low in nitrogen	191533K	-	191536N	191537X



## Titration

AVS® TITRINORM® products are ready to use solutions for direct or back titration. Concentrated buffers are also available.

AVS® TITRINORM®	Concentration	Pk			
		1 l	2,5 l	5 l (bag-in-box)	10 l (bag-in-box)
Hydrochloric acid solution	0,02 mol/l (0,02N)	98052.296	-	-	-
	0,1 mol/l (0,1N)	31955.293	31955.327	31955.373	31955.407
	0,2 mol/l (0,2N)	31983.290	-	31983.370	-
	0,5 mol/l (0,5N)	31954.290	-	31954.404	-
	1 mol/l (1N)	30024.290	30024.324	30024.370	30024.404
	2 mol/l (2N)	30025.293	30025.320	30025.373	30025.407
Sulphuric acid solution	0,05 mol/l (0,1N)	30150.295	30150.320	30150.375	30150.400
	0,1 mol/l (0,2N)	30145.297	-	-	30145.402
	0,25 mol/l (0,5N)	30143.291	-	-	30143.405
	0,5 mol/l (1N)	30144.294	30144.328	-	30144.408
	1 mol/l (2N)	30149.291	30149.325	30149.371	-
Sodium hydroxide solution	0,1 mol/l (0,1N)	31770.294	-	31770.374	31770.408
	0,2 mol/l (0,2N)	31952.293	-	-	-
	0,25 mol/l (0,25N)	31956.296	-	-	-
	0,5 mol/l (0,5N)	31951.290	-	31951.370	31951.404
	1 mol/l (1N)	31627.290	-	-	31627.404
	2 mol/l (2N)	98108.290	-	-	98108.400



## Indicators

Description	Pk (ml)	Cat.No.
Mixed indicator	100	87870.180
Methyl red 0,2 g/l in solution	250	34302.231

## Nitrogen-free filters, grade 521

Nitrogen-free filters for determination of nitrogen content in steel and iron samples dissolved in acid. Filtration of fine precipitates to dissolve according Kjeldahl method.

Weight	85 g/m <sup>2</sup>
Thickness	0,17 mm
Filtration speed	650 s (Hz)

Description	Size (mm)	Pk	Cat.No.
Grade 521	90	100	516-0316
Grade 521	100x100	100	516-0317



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