

# UV/Vis spectroscopy

## Examples of some applications at Analyscentrum

- ❑ Determination of formaldehyde in absorption solutions from 1 m<sup>3</sup> chamber (SOP-KEMI-042, chromotropic acid method)
- ❑ Determination of formaldehyde in water from emission measurements according to JAS, flask etc (acetylacetone method)
- ❑ Determination of melamine and urea in resins and paper (81 AM 0001)
- ❑ Determination of absorption maxima of compounds for optimizing UV/Vis detection in HPLC

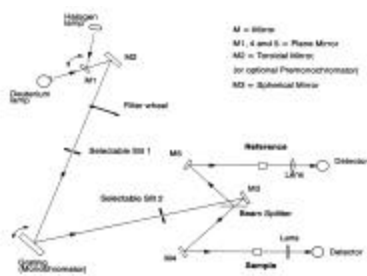


Figure 5-4 Optical Path Layout 14

$$T = I/I_0$$

$$A = \log 1/T =$$

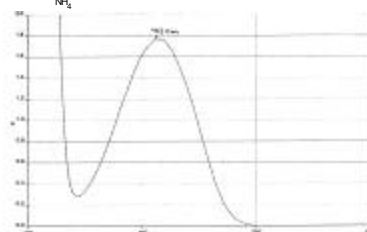
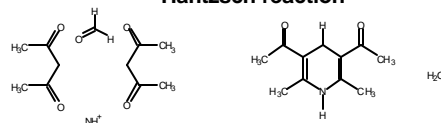
Table 5-3. Colors of Visible Radiation

Approximate wavelength range, nm	Color	Complement
380-430	Violet	Yellow-green
430-480	Blue	Yellow
480-490	Cyan-blue	Orange
490-500	Blue-green	Red
500-560	Cyan	Purple
560-570	Yellow-green	Violet
570-580	Yellow	Blue
580-620	Orange	Cyan-blue
620-750	Red	Magenta

The colour of the light

The colour of the solution

### Hantzsch reaction



# Instrumentation at Analyscentrum Lambda 14

<b>Type</b>	Scanning double-beam spectrometer	
<b>Beam cross-section</b>	0.5 nm slit	ca. 0.25 x 7 mm (width x height)
	1 nm slit	ca. 0.5 x 7.5 mm
	2 nm slit	ca. 1 x 7.5 mm
	4 nm slit	ca. 2 x 7.5 mm
<b>Optical path length in sample compartment</b>	121 mm	
<b>Beam center height</b>	15 mm above cell holder bottom	
<b>Monochromator</b>	Holographic concave grating with 1053 lines/mm in the center	
<b>Radiation sources</b>	Prealigned deuterium and halogen lamps	
<b>Lamp change</b>	automatically at 326 nm	
<b>Wavelength range</b>	190 – 1100 nm	
<b>Wavelength accuracy</b>	± 0.3 nm	
<b>Wavelength reproducibility</b>	± 0.1 nm	
<b>Spectral bandwidth</b>	0.5, 1, 2 and 4 nm	
<b>Scan speeds</b>	0.125 – 48 nm/sec	
<b>Absorbance range</b>	-6 to 6 A	
<b>Accuracy</b>	± 0.003 A	
<b>Stray radiation</b>	< 0.001 %T	
<b>Baseline linearity</b>	± 0.001 A with 1 nm slit	
<b>Baseline noise</b>	< 0.0003 A with 1 nm slit	
<b>Baseline drift</b>	< 0.0003 A per hour	

# UV/Vis spectroscopy

## Cuvettes at Analyscentrum

0.1, 10, 20, 50 and 100 mm  
Small volume (100  $\mu$ l)  
Glass (300 - 1100 nm)  
Quartz (190 - 1100 nm)  
With ground lid  
Flow-through

## Different cuvette materials

