



Production and use of indigo (C5.2.4.1)

C5.2.4
PIGMENTS AND DYESTUFFS

C5.2.4.1
Production and use of indigo

Cat. No.	Description	C5.2.4.1
664 246	Erlenmeyer flask, DURAN, 100 ml, wide neck	1
665 162	Büchner funnel, 70 mm diam.	1
661 031	Round filter, Type 595, 70 mm diam., 100 pcs.	1
665 060	Rubber collars, set of 7	1
664 866	Suction flask, 500 ml, glass	1
382 21	Stirring thermometer -10...+110 °C	1
666 967	Spoon-ended spatula, stainless steel, 150 mm	1
665 751	Measuring cylinder 10 ml, with plastic base	1
665 754	Measuring cylinder 100 ml, with plastic base	1
665 996	Graduated pipette, 5 ml	1
666 003	Pipetting ball (Peleus ball)	1
664 101	Beaker, DURAN, 100 ml, squat	1
602 043	Beaker, DURAN, 150 ml, squat	1
664 103	Beaker, DURAN, 250 ml, squat	1
664 154	Watch glass dish 80 mm Ø	1
665 212	Glass stirring rod 200 x 8 mm Ø	1
667 7977	Electronic Balance 440-3N, 200 g : 0.01 g	1
375 56	Water jet pump	1
667 186	Vacuum rubber tubing, 8 mm diam.	1
666 839	Magnetic stirrer with hotplate	1
673 9390	2-Nitrobenzaldehyde, 5 g	1
670 0410	Acetone, 1 l	1
673 8420	Sodium hydroxide solution, 1 mol/l, 500 ml	1
671 9711	Ethanol, absolute, 500 ml	1
673 6310	Sodium dithionite, 250 g	1

Cat. No.	Description	C5.2.4.1
673 6810	Sodium hydroxide, pellets, 250 g	1
	additionally required: white cotton cloth	1

Synthetic dyes have been known since the middle of the 19th century. Many major chemical companies started out as dye producers. The first dyes were extracted from tar. Today most dyes are based on crude oil.

Chemical compounds are coloured when they absorb wavelengths from the visible range of the spectrum. The compound then appears in the complementary colour of the absorbed wavelength. Along with their colour, the ability to colour materials more or less colourfast is a decisive feature of dyes. That colouring is done by binding the dyes to the carrier materials or having the dyes penetrate into them. This, too, can be influenced by chemical means.

Experiment C5.2.4.1 synthesizes indigo, the dye used to colour jeans. Developed by Adolf von Baeyer in 1870, this synthesis was one of the first dye syntheses to be applied on an industrial scale. The educt used is nitrobenzaldehyde, which condenses with acetone under base conditions. The reduced, soluble leuco form of the dye is insolubly anchored in the tissue through oxidation by air.