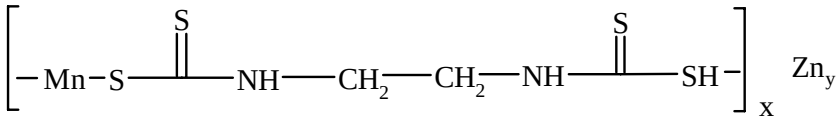
MANCOZEB
34



ISO common name	Mancozeb
Chemical composition	Co-ordination complex of zinc and maneb containing 20 % manganese and 2.5 % zinc
m.p.	Decomposes
v.p.	Negligible
Solubility	Insoluble in water and most organic solvents
Description	Yellow powder
Stability	Decomposed under acid conditions
Formulations	Wettable powders, water dispersible granules, suspension concetrantes and dustable powders

MANCOZEB TECHNICAL

[*]**34**/TC/M/-

1 Sampling. Take at least 200 g. Fill the bottles completely and store them (not longer than 4 weeks) at a temperature below 20 °C.

2 Identity tests
2.1 CS_2 evolution. MT 153.
2.2 Spot test. MT 130.
2.3 Identification of amines. MT 152.
2.4 Zinc. MT 154.

3 Mancozeb. As for maneb technical **61**/TC/M/3, CIPAC E, *p.*117, except:

(c) Calculation

$$\text{Mancozeb content} = \frac{135.5 \times N \times (t - b)}{w} \text{ 1g/kg}$$

4 Manganese and zinc

OUTLINE OF METHOD The sample is dissolved in a known amount of EDTA solution in excess. The excess is titrated with standard magnesium sulphate, using Mordant black 11 as indicator, to determine total metals. Potassium cyanide is added and the solution is titrated again with magnesium sulphate to determine the zinc. The manganese is determined from the difference of the titres.

REAGENTS

Ammonia buffer solution pH 10, MT 107
EDTA 0.05 mol/l, RE 37.3
Magnesium sulphate standard solution 0.05 mol/l. Dissolve magnesium sulphate heptahydrate (12.33 g) in water and make up to 1 l.
Mordant black 11 solution, RE 53.1
Ascorbic acid
Potassium cyanide (KCN)

[*] CIPAC method 1972. Prepared by the Dithiocarbamate Panel of PAC-UK. Chairman: A Stevenson (Robinson Bros. Ltd)

APPARATUS

Conical flask 400 ml, wide mouth

PROCEDURE

Weigh (to the nearest 0.1 mg) 500 ± 50 mg (*w* mg) of sample, transfer to a conical flask (400 ml) with water (about 50 ml) and add EDTA solution (50.0 ml). Bring to the boil and swirl to dissolve as completely as possible. Cool to room temperature, add ascorbic acid (1 to 1.5 g), swirl to dissolve, and add ammonia buffer solution (10 ml).
Add Mordant black indicator (a few drops) and titrate the excess EDTA with magnesium sulphate solution (0.05 mol/l, *a* ml), the end point is the first tinge of purple in the blue green resulting from the yellow of the solution and the blue of the indicator. Adjust the end point as accurately as possible using a microburette and add KCN (about 2 g). Titrate the liberated EDTA with magnesium sulphate solution (0.05 mol/l) added from the microburette (*b* ml).

$$\text{Zn content} = \frac{65.37 \times N \times b}{w} \text{ 2g/kg}$$

Titrate EDTA (50.0 ml) with magnesium sulphate solution (0.05 mol/l, *c* ml) in the presence of buffer (15 ml) and a few drops of indicator. The end point is the first tinge of purple appearing in the blue colour.

$$\text{Mn content} = \frac{54.94 \times N \times [c - (a + b)]}{w} \text{ 3g/kg}$$

where:
N = molarity of the magnesium sulphate

5 Arsenic. MT 99.

MANCOZEB WETTABLE POWDERS
*34/WP/M/-

1 Sampling. Take at least 500 g. Fill the bottles completely and store them (not longer than 4 weeks) at a temperature below 20 °C.

2 Identity tests. As for mancozeb technical **34**/TC/M/2.

3 Mancozeb. As for mancozeb technical **34**/TC/M/3.

4 Manganese and zinc. As for mancozeb technical **34**/TC/M/4.

5 Arsenic. MT 99.

6 Suspensibility. As for maneb wettable powders **61**/WP/M/5, CIPAC E, *p. 120,* except:

Mass of mancozeb in the 25 ml of suspension $= 0.1355 \times N \times (t - b) = Q$ 4g.

MANCOZEB WATER DISPERSIBLE GRANULES
*34/WG/M/-

1 Sampling. Take at least 500 g. Fill the bottles completely and store them (not longer than 4 weeks) at a temperature below 20 °C.

2 Identity tests. As for mancozeb technical **34**/TC/M/2.

3 Mancozeb. As for mancozeb technical **34**/TC/M/3.

4 Manganese and zinc. As for mancozeb technical **34**/TC/M/4.

5 Arsenic. MT 99.

6 Suspensibility. As for maneb wettable powders **61**/WP/M/5, CIPAC E, *p. 120,* except:

Mass of mancozeb in the 25 ml of

* CIPAC method 1972. Prepared by the Dithiocarbamate Panel of PAC-UK. Chairman: A Stevenson (Robinson Bros. Ltd).

suspension $= 0.1355 \times N \times (t - b) = Q$ 5g.

MANCOZEB SUSPENSION CONCENTRATES
* **34**/SC/M/-

1 Sampling. Take at least 500 g. Fill the bottles completely and store them (not longer than 4 weeks) at a temperature below 20 °C.

2 Identity tests. As for mancozeb technical **34**/TC/M/2.

3 Mancozeb. As for mancozeb technical **34**/TC/M/3.

4 Manganese and zinc. As for mancozeb technical **34**/TC/M/4.

5 Arsenic. MT 99.

6 Suspensibility. As for maneb wettable powders **61**/WP/M/5, CIPAC E, *p. 120*, except:
Mass of mancozeb in the 25 ml of suspension $= 0.1355 \times N \times (t - b) = Q$ 6g.

MANCOZEB DUSTABLE POWDERS
*34/DP/M/-

1 Sampling. Take at least 1 kg. Fill the bottles completely and store them (not longer than 4 weeks) at a temperature below 20 °C.

2 Identity tests. As for mancozeb technical **34**/TC/M/2.

3 Mancozeb. As for mancozeb technical **34**/TC/M/3.

4 Manganese and zinc. As for mancozeb technical **34**/TC/M/4.

5 Arsenic. MT 99.

6 Dry seive test. As for maneb dustable powders **61**/DP/M/5, CIPAC E, *p.*121, except:
Mass of mancozeb in the residue $= 0.1355 \times N \times (t - b)$ 7g.

* CIPAC method 1972. Prepared by the Dithiocarbamate Panel of PAC-UK. Chairman: A Stevenson (Robinson Bros. Ltd)