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TECHNICAL DATA SHEET 408

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Methyl Methacrylate & Butyl Methacrylate Kit

Background:

Blending methyl methacrylate (MMA) and butyl methacrylate (BMA) will yield a clear and firm cast. The plastic can be removed from the sections before staining with xylene or acetone treatment. Polymerization can be obtained with the addition of benzoyl peroxide at 60°C or with the addition of benzoin methyl ether, a photocatalyst, and ultraviolet illumination.

MMA and BMA Embedding Media can be used for electron microscopy with the addition of a cross-linking agent such as divinyl benzene¹ (not included in this kit). By changing the amount of BMA, the hardness of the block can be varied. A greater ratio of BMA will produce a softer block.

Procedures:

Methacrylates are soluble in ethanol and acetone. Intermediate clearing solvents are not required before infiltration of the tissue with the resin.

After fixation, washing, and dehydration, samples are infiltrated first with a 1:1 mixture of 95% ethanol and MMA/BMA mix with either benzoyl peroxide (catalyst) or benzoin methyl ether (catalyst) for 1 hour; methacrylate and catalyst for 1 hour. Then infiltrated with two changes of methacrylate and catalyst for 1 hour each. Polymerization is achieved overnight at 60°C, or 12-24 hours with U.V. at room temperature, or in the cold (4°C) using fresh embedding media.

1. The appropriate methacrylate mix ratio is MMA 8:2 BMA or MMA 9:1 BMA with 1% w/v benzoyl peroxide for thermal cure.
2. When using a photocatalyst cure with U.V., prepare methacrylate resin using the same ratio (8:2 or 9:1) with 0.5% benzoin methyl ether. Polymerize by using a long-wave U.V. lamp (3600 Å range). Exposure time varies depending on lamp's distance from the specimen and on the wattage of the lamp used. Position molds to allow the U.V. penetration of the entire block.

Embedding must be done in closed BEEM* capsules, gelatin capsules or other closed containers.

Larger quantities of catalyzed resin polymerize more rapidly, causing high temperatures which could damage tissue structure. Keep quantities in final casts as small as possible.

Photopolymerization at colder temperatures will require longer set-up time.

The methacrylates in this kit contain the inhibitor needed only to prevent polymerization upon storage. The inhibitor does not need to be removed before use if the proper ratio of catalyst is used.

Handling Precautions:

Caution: Impervious gloves and good laboratory handling procedures are to be employed when working with MMA & BMA Kit ingredients. Care should be taken to avoid skin contact and inhalation of vapors. In case of skin contact, and after removing gloves, immediately and thoroughly wash with soap and water. Work should be conducted in a well-ventilated area. Use of disposable utensils and tools is recommended. The full chemical, physical, and toxicological properties of the products mentioned herein are not known. Some people report skin sensitivities to methacrylates. If there is any noticeable irritation, use of the MMA & BMA Kit should be discontinued. All components may cause irritation.

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Storage Precautions:

MMA can be safely stored at room temperature. BMA should be stored at 4°C.

Benzoyl peroxide (Catalyst): This is an organic peroxide and should be kept cool and tightly sealed to avoid drying out. Avoid grinding or contact with flammable or reducing agents. The catalyst decomposes as it ages; therefore, aged catalyst may require a greater amount, a longer time, or more heat to achieve the same results as fresh catalyst.

Benzoin methyl ether: Avoid skin contact at all times!

Disposal:

The catalyst may be destroyed by adding it in small portions to cold 10% sodium hydroxide solution. Use at least 4 times as much solutions as the weight of the catalyst. Do not allow material to settle or form lumps. Dispose of this solution along with other hazardous wastes in accordance with local, state, and federal regulations.

References:

1. Glauert, Audrey M. *Practical Methods in Electron Microscopy*, Vol. 3, Part 1. Elsevier Publishers, New York, 1975, p. 154.
2. Palade, G.E., *J. Exp. Med.*, **95**, 285 (1975).
3. Pease, Daniel C. *Histological Techniques for Electron Microscopy*, 2nd ed. Academic Press, New York, 1964.

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Ordering Information:

Cat. #	Description	Size
#03573	Methyl Methacrylate & Butyl Methacrylate (MMA & BMA) Kit Contains: 2x500g Methyl Methacrylate; 500g Butyl Methacrylate; 9g Benzoyl Peroxide; 10g Benzoin Methyl Ether	1 kit

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