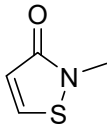


皮膚障害物質データシート

2-methyl-4-isothiazolin-3-one (MI)

化学構造式 (Structure)	
化学物質名 (Generic Name)	2-Methyl-4-isothiazolin-3-one (MI) Methylisothiazolinone 2-メチル-4-イソチアゾリン-3-オン
元素組成、分子量 (Molecular Formula, Molecular Weight)	C4H5NOS = 115.15
NITE-CHRIP ID	C005-842-63A
用途 (Use, Activity)	防腐剤、殺菌剤、抗菌防臭剤

化合物情報、皮膚障害情報

2-Methyl-4-isothiazolin-3-one (MI) は、イソチアゾリノンミックス (5-Chloro-2-methyl-4-isothiazolin-3-one (CMI) + 2-Methyl-4-isothiazolin-3-one (MI) 3:1 Mixture ; CMI/MI) の成分の一つである。アレルゲン名としては、Methylisothiazolinone (MI) が主に用いられている。

MI は、欧州では感作性の強さから使用できなくなっていた CMI/MI の代わりに 2004 年から MI 単独使用が認められ、洗い流せるタイプ (リーブオフ) の化粧品、シャンプー等に用いられるようになった(1,2)。MI も防腐効果が高いため、塗料、洗浄剤、接着剤、冷却水、ウェットティッシュの抗菌剤としても用いられていた。

MI が単独使用されるようになってから、MI 含有製品によるアレルギー性接触皮膚炎の報告が欧州で多発し、その後、北米、アジア圏へ広まった(3-55)。欧米では、MI による感作が増加したため、MI のパッチテスト結果も陽性率が上昇し、さらに、MI を含むイソチアゾリノンミックスの陽性率が上昇したと考えられている(56-141)。欧米における MI によるアレルギー性接触皮膚炎の発症、感作率の上昇は、落ち着きを見せてきているものの、依然として大きな問題となっている。

欧米では、塗料、洗浄剤の製造現場で職業性の MI によるアレルギー性接触皮膚炎が発

生している(3,37,49)。また、塗装及び塗装後、塗料に含まれていた MI が揮発して感作されるアレルギー性接触皮膚炎 (airborne contact dermatitis) も発生している(4,8,9,28,35,39,40,44,51,61,62,78,127)。欧州では、ウェットティッシュ、ウェットワイプの抗菌剤として用いられた MI により、乳幼児、子供の感作が増加したことが問題視された(11,13-17,33,43,52)。

なお、欧州では、2017 年より、MI の使用量を規制するに至っている(142)。タイでは規制が行われた(143)

日本では、MI 単独のアレルギー性接触皮膚炎の報告は少なく、化粧液及び冷却タオルによるアレルギー性接触皮膚炎の報告がある程度である(144-146)。日本での MI による感作の調査が進んでいないことが原因の一つと考えられる。日本では、冷却タオルに用いられた防腐剤によるアレルギー性接触皮膚炎の問題があり、国民生活センターが報道発表している。

MI は、CMI/MI と同様に水溶性であり、脂溶性である 4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one (DCOIT) 及び 2-n-Octyl-4-isothiazolin-3-one (OIT) とは防腐剤、抗菌剤としての対象の用途が分かれている。

MI、CMI、DCOIT、OIT 等の 4-イソチアゾリン-3-オン構造を持つ類似の化学物質は、感作物質として知られており、それぞれに交差反応の特長がある(図-1)(147-159)。

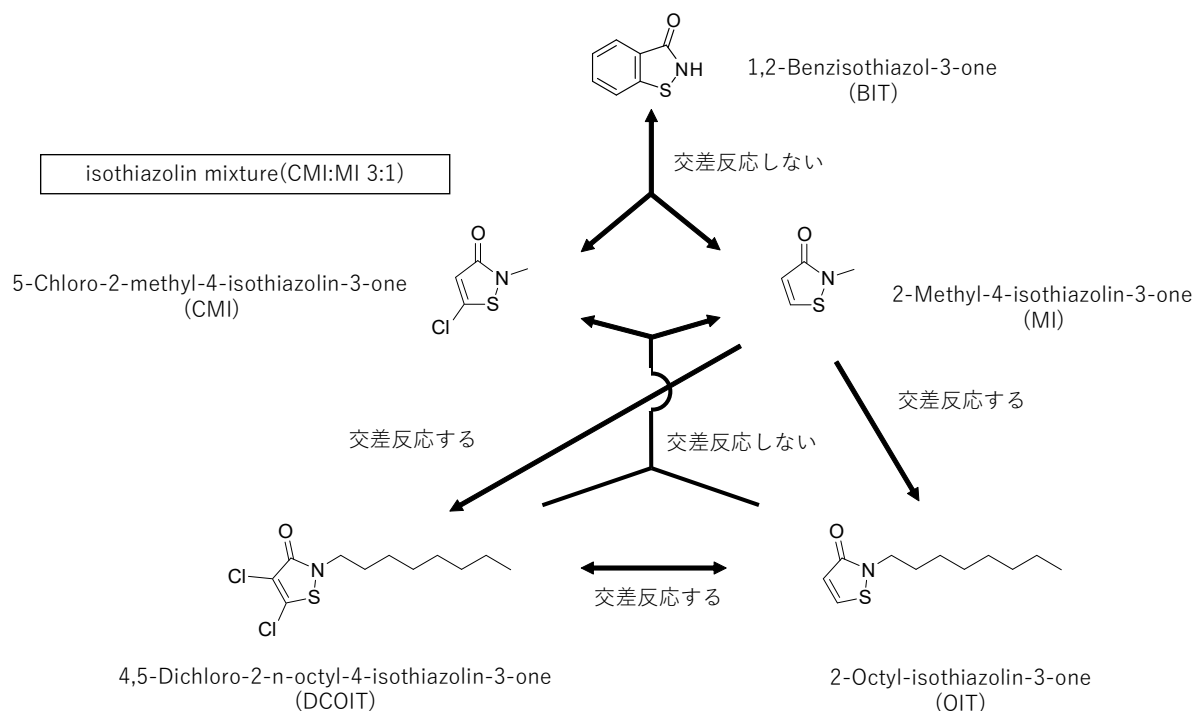


図-1 4-イソチアゾリン-3-オン系防腐剤・抗菌剤の交差反応

MI 及び CMI/MI のパッチテストの陽性率は、MI の方が陽性率が高い傾向がある。これは、MI に感作されている人の割合が高いとする一方、CMI/MI に陽性反応を示さない人もいることによる。CMI/MI が 0.02%aq でパッチテストを施行するのに対して、MI は、

0.2%aq でパッチテストしているため、濃度差があるとの指摘もあるが、現状では、CMI/MI は、CMI の感作を検出しており、MI と CMI は、交差反応ではなく、異なるアレルゲンの反応を検出しているとされている。よって、欧州では MI と CMI/MI を同時にパッチテストを施行している。MI と CMI の反応性の違いは、核磁気共鳴装置 (NMR) を用いた分析でも確認された(160)。MI と CMI は、異なる反応によるものと考えれば MI、CMI と他のイソチアゾリン化合物との交差反応性の違い (図-1) の原因と考えることもできる。

MI は、動物実験の結果、強感作物質とされた(161,162)。リスク評価の結果も感作物質とされた(163-165)。

MI、CMI/MI は、強感作物質とされたため、1,2-Benzisothiazolin-3-one (BIT) に変更する動きがある(166)。しかし、BIT にも感作性があるため今後の動向に注意する必要がある(166,167)。

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