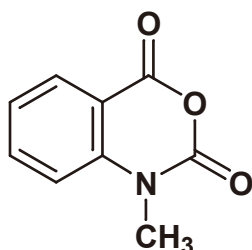


# RNA Structure Analysis Reagents

Nucleobase-specific probes modify different bases on RNA to detect higher-order structures derived from the bases. Alternatively, SHAPE (Selective 2'-Hydroxyl Acylation and Primer Extension) probes react with the backbone of the RNA, enabling the monitoring of all nucleotides.

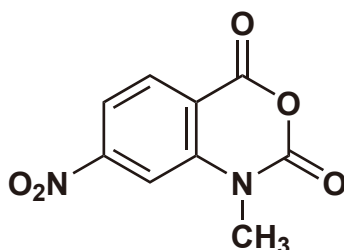
## SHAPE Probes



**N-Methylisatoic Anhydride**

5g / 25g

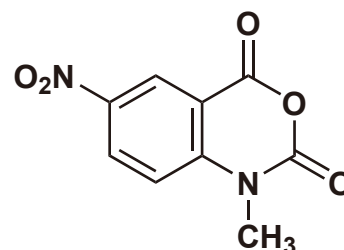
[M0743]



**1-Methyl-7-nitroisatoic Anhydride**

100mg

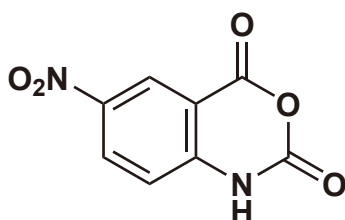
[M3578] **New**



**1-Methyl-6-nitroisatoic Anhydride**

100mg

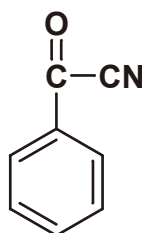
[M3589] **New**



**5-Nitroisatoic Anhydride**

1g

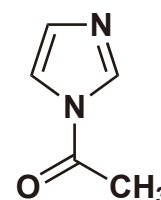
[N1245] **New**



**Benzoyl Cyanide**

25g

[B0835]



**N-Acetylimidazole**

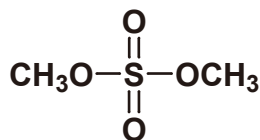
25g

[A0694]

| Probes  | Half-Life Time (*) | Characteristics   |
|---|--------------------|---|
| <b>N-Methylisatoic Anhydride</b><br>(= NMIA)        | <b>430 sec.</b>    | Widely used as a SHAPE reagent. Unsuitable for modification of intracellular RNA. <sup>1)</sup>   |
| <b>1-Methyl-7-nitroisatoic Anhydride</b><br>(= 1M7) | <b>14 sec.</b>     | Widely used as a SHAPE reagent. The nucleotide bias is low. It tends to favor <i>in vitro</i> over <i>in vivo</i> use compared to other SHAPE reagents. <sup>2)</sup>   |
| <b>1-Methyl-6-nitroisatoic Anhydride</b><br>(= 1M6) | <b>31 sec.</b>     | Similar to 1M7, it has high versatility and is suitable for cell-free assays. It has faster reactivity than NMIA. <sup>3)</sup>   |
| <b>5-Nitroisatoic Anhydride</b><br>(= 5NIA)         | <b>~100 sec.</b>   | Suitable for the modification of RNA in living cells. <sup>2)</sup>   |
| <b>Benzoyl Cyanide</b><br>(= BzCN)                  | <b>0.25 sec.</b>   | Useful for tracking RNA folding in seconds due to its fast reaction rate and rapid inactivation by hydrolysis. <sup>4)</sup>  |
| <b>N-Acetylimidazole</b><br>(= Aclm)                | <b>3-30 min.</b>   | Produces minimal acetyl adducts. It has been reported that the reaction rate is faster than 2-Methylnicotinic Acid Imidazolide (= NAI). More suitable for structural profiling of long RNAs in nanoSHAPE than other SHAPE probes. <sup>5,6)</sup> |

\*Measurement conditions vary according to the reported paper.

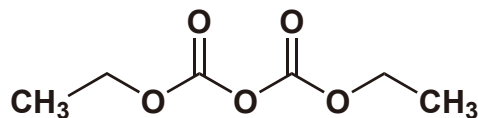
## Nucleobase-specific Probes



**Dimethyl Sulfate**

25g / 500g

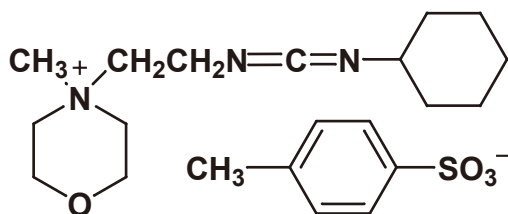
[D0797]



**Diethyl Pyrocarbonate**

5g / 25g

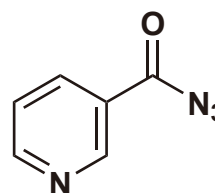
[O0103] **New**



**1-Cyclohexyl-3-(2-morpholinoethyl)-  
carbodiimide Metho-*p*-toluenesulfonate**

5g / 25g

[C0793]



**Nicotinoyl Azide**

50mg

[N1268] **New**

| Probes  | Main Modification Positions <sup>7)</sup>           |
|---|---|
| <b>Dimethyl Sulfate</b><br>(= DMS)  | Guanine N7, Adenine N1, Cytosine N3<br>(Alkylation) |
| <b>Diethyl Pyrocarbonate</b><br>(= DEPC)  | Guanine N7<br>(Ethoxycarbonylation)                 |
| <b>1-Cyclohexyl-3-(2-morpholinoethyl)-<br/>carbodiimide Metho-<i>p</i>-toluenesulfonate</b><br>(= CMCT) | Guanine N1, Uracil N1<br>(Formation of CMCT Adduct) |
| <b>Nicotinoyl Azide</b><br>(= Naz)  | Guanine C8, Adenine C8<br>(Nicotinoylation)         |

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- 2) S. Busan, K. M. Weeks, *et al.*, *Biochemistry* **2019**, *58*, 2655. <https://doi.org/10.1021/acs.biochem.8b01218>
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- 7) E. J. Strobel, A. M. Yu, J. B. Lucks, *Nat. Rev. Genet.* **2018**, *10*, 615. <https://doi.org/10.1038/s41576-018-0034-x>

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