

# Diphenylcyclopropenone

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**Diphenylcyclopropenone** (**diphencyprone**) is a **topically administered** experimental drug intended for treating **alopecia areata** and **alopecia totalis**.<sup>[1]</sup> Topical immunotherapy using diphenylcyclopropenone may also be an effective treatment option for recalcitrant warts.<sup>[2]</sup> It is not approved by either the **Food and Drug Administration** or the **European Medicines Agency**.<sup>[3]</sup>

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## Mechanism of action [ edit ]

Diphenylcyclopropenone triggers an immune response that is thought to oppose the action of the autoreactive cells that otherwise cause hair loss.<sup>[4]</sup> One hypothesis is that in response to DPCP treatment, the body will attempt to downregulate inflammation through a variety of pathways, resulting in a downregulation of the autoimmune response at the hair follicle. This autoinflammatory reaction would otherwise destroy body's hair follicles.<sup>[3]</sup>

## Studies [ edit ]

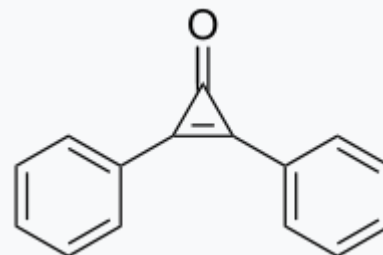
A study of 41 alopecia areata patients showed significant hair regrowth in 40% at 6 months, being sustained in two thirds of these after a 12-month-follow up-period.<sup>[5]</sup>

In a 2002 study for the treatment of warts, the responders consisted of 135 individuals (87.7%) that had complete clearance of warts. Reported adverse effects were local and included with pruritus (itching) (15.6%), with blistering (7.1%), and with eczematous reactions (eczema)(14.2%). The majority of the patients tolerated the treatment very well. One patient developed local impetigo (minor infection). Patients had an average of 5 treatments over a 6-month period.<sup>[2]</sup>

## Chemical properties [ edit ]

The chemical properties of diphenylcyclopropenone are dominated by the strong **polarization** of the **carbonyl**group, which gives a partial positive charge with **aromatic stabilization** on the cyclopropene ring and a partial negative charge on oxygen. Furthermore, the phenyl groups stabilize the partial positive charge in the ring through **resonance**.

## Diphenylcyclopropenone



### Names

IUPAC name

2,3-Diphenylcycloprop-2-en-1-one

Other names

Diphencyprone, DPCP, DPC

### Identifiers

CAS Number

886-38-4

3D model (JSmol)

[Interactive image](#)

ChemSpider

[58568](#)

ECHA InfoCard

[100.011.772](#)

PubChem CID

[65057](#)

UNII

[I7G14NW5EC](#)

InChI

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SMILES

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### Properties

Chemical formula

C<sub>15</sub>H<sub>10</sub>O

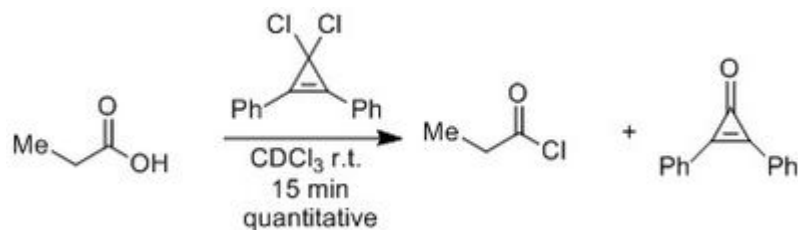
Molar mass

206.24 g·mol<sup>−1</sup>

Except where otherwise noted, data are given for materials in their **standard state** (at 25 °C [77 °F], 100 kPa).

[Infobox references](#)

Diphenylcyclopropenone reacts with [oxalyl chloride](#) to give 1,1-dichloro-2,3-diphenylcyclopropene, which is a reagent for the activation of carboxylic acids:<sup>[6]</sup>



## See also  [ [edit](#) ] ]

- [Benzophenone](#)
- [Cyclopropenone](#)

## References  [ [edit](#) ] ]

- ↑ Singh G, Lavanya M (January 2010). "Topical immunotherapy in alopecia areata". *International Journal of Trichology*. **2** (1): 36–9. doi:10.4103/0974-7753.66911. PMC 3002409 . PMID 21188022.
- ↑ <sup>**a**</sup> <sup>**b**</sup> Uptis JA, Krol A (2002). "The use of diphenylcyclopropenone in the treatment of recalcitrant warts". *Journal of Cutaneous Medicine and Surgery*. **6** (3): 214–7. doi:10.1007/s10227-001-0050-9. PMID 11951129.
- ↑ <sup>**a**</sup> <sup>**b**</sup> Bulock KG, Cardia JP, Pavco PA, Levis WR (November 2015). "Diphencyprone Treatment of Alopecia Areata: Postulated Mechanism of Action and Prospects for Therapeutic Synergy with RNA Interference". *The Journal of Investigative Dermatology. Symposium Proceedings*. **17** (2): 16–8. doi:10.1038/jidsymp.2015.33. PMID 26551938.
- ↑ Public summary of positive opinion for orphan designation of diphenylcyclopropenone for the treatment of alopecia totalis , [European Medicines Agency](#). Document Date: London, 23 April 2009. Doc.Ref.:EMA/COMP/428277/2006
- ↑ Sotiriadis D, Patsatsi A, Lazaridou E, Kastanis A, Vakirlis E, Chrysomallis F (January 2007). "Topical immunotherapy with diphenylcyclopropenone in the treatment of chronic extensive alopecia areata". *Clinical and Experimental Dermatology*. **32** (1): 48–51. doi:10.1111/j.1365-2230.2006.02256.x. PMID 17004987.
- ↑ Hardee DJ, Kovalchuke L, Lambert TH (April 2010). "Nucleophilic acyl substitution via aromatic cation activation of carboxylic acids: rapid generation of acid chlorides under mild conditions". *Journal of the American Chemical Society*. **132** (14): 5002–3. doi:10.1021/ja101292a. PMID 20297823.

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