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**(Summary Chart Comparing Substitute Claims 29-44,
Disclaimed Claims 1-7, 9-11, 24-26, 28, 29, 35, and 36 of U.S. Patent No. 10,882,803, and
Remaining Unadjudicated Claims 8, 12-23, 27, 30-34, 37, and 38 of U.S. Patent No. 10,882,803)**

Substitute Claims 29-44 in IPR2023-01035	Disclaimed Claims 1-7, 9-11, 24- 26, 28, 29, 35, and 36 of U.S. Patent No. 10,882,803	Remaining Unadjudicated Claims 8, 12-23, 27, 30-34, 37, and 38 of U.S. Patent No. 10,882,803
29. A process for making a bio-alkene, comprising: dehydrating a bio-1-alcohol by heating the bio-1-alcohol in a continuous flow reactor at a temperature of 240 °C to 360 °C with a calcium-promoted γ-alumina catalyst calcined at a temperature of about 420 °C to about 480 °C, wherein the catalyst has not been silanized, and wherein the resulting bio-alkene has a carbon chain of 6 to 10 carbon atoms and is produced in a conversion of at least 95% and a bio-1-alkene regioselectivity of 95% to about 99% from a single-pass	1. A process for the synthesis of bio-1,2-alkanediols, comprising: providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms.	8. A process for the synthesis of bio-1,2-alkanediols, comprising: providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms, wherein the bio-alkene results from a process wherein a bio-1-alcohol is dehydrated by heating the bio-1-alcohol in a reactor with a catalyst, wherein the reactor is a fixed bed reactor, and wherein the fixed bed

reaction after at least 20 hours time-on-stream.		reactor is a fluidized fixed bed reactor.
30. The method of claim 29, wherein the bio-alkene has a carbon chain of 6 to 8 carbon atoms.	2. The process of claim 1, wherein the bio-alkene and the bio-1,2-alkanediol each have a carbon chain of about 6 to about 14 carbon atoms.	
31. The method according to claim 29, wherein the bio-alkene has a carbon chain of 6 carbon atoms.	3. The process according to claim 2, wherein the bio-alkene and the bio-1,2-alkanediol each have a carbon chain length of about 6 to about 10 carbon atoms.	
32. The method according to claim 29, wherein the bio-alkene is bio-octene.	4. The process according to claim 3, wherein the bio-alkene and the bio-1,2-alkanediol each have a carbon chain length of about 6 to about 8 carbon atoms.	
33. The method according to claim 29, wherein the calcium-promoted γ -alumina has a CaO content of about 1% to about 2%.	5. The process according to claim 1, wherein the bio-alkene is bio-octene and the bio-1,2-alkane diol is bio-1,2-octanediol.	
34. The method according to claim 33, wherein prior to the dehydrating, the calcium-promoted catalyst has been calcined at a	6. The process according to claim 1, wherein the bio-alkene results from a process wherein a bio-1-alcohol is	

temperature of about 440 °C to about 460 °C.	dehydrated by heating the bio-1-alcohol in a reactor with a catalyst.	
35. The method according to claim 34, wherein the reactor is heated at a temperature of 315 °C to 350 °C.	7. The process according to claim 6, wherein the reactor is a fixed bed reactor.	
36. The method according to claim 30, wherein the calcium-promoted γ -alumina has a CaO content of about 1% to about 2%.		
37. The method according to claim 36, wherein prior to the dehydrating, the calcium-promoted catalyst has been calcined at a temperature of about 440 °C to about 460 °C.	9. The process according to claim 6, wherein the catalyst is selected from ZnAl_2O_4 and a γ -alumina catalyst.	
38. The method according to claim 37, wherein the reactor is heated at a temperature of 315 °C to 350 °C.	10. The process according to claim 9, wherein the bio-alkene has a bio-1-alkene regioselectivity of about 92% to about 99%.	
39. The method according to claim 31, wherein the calcium-promoted γ -alumina has a CaO content of about 1% to about 2%.	11. The process according to claim 10, wherein the bio-alkene have a bio-1-alkene regioselectivity of about 95% to about 99%.	

40. The method according to claim 39, wherein prior to the dehydrating, the calcium-promoted catalyst has been calcined at a temperature of about 440 °C to about 460 °C.		12. A process for the synthesis of bio-1,2-alkanediols, comprising: providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms, wherein the bio-alkene results from a process wherein a bio-1-alcohol is dehydrated by heating the bio-1-alcohol in a reactor with a catalyst, wherein the catalyst is selected from ZnAl_2O_4 and a γ-alumina catalyst, and wherein the bio-alkene have a bio-1-alkene regioselectivity of about 95% to about 99%, <u>wherein the process yields at least about 92% to about 99% of the bio-1,2-alkanediol.</u>
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41. The method according to claim 40, wherein the reactor is heated at a temperature of 315 °C to 350 °C.		13. A process for the synthesis of bio-1,2-alkanediols, comprising: providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms, wherein the bio-alkene results from a process wherein a bio-1-alcohol is dehydrated by heating the bio-1-alcohol in a reactor with a catalyst, <u>wherein the catalyst is a γ-alumina catalyst is treated with a base to form a modified γ-alumina catalyst.</u>
42. The method of according to claim 32, calcium-promoted γ -alumina has a CaO content of about 1% to about 2%.		14. The process according to claim 13, <u>wherein the base comprises a Group I or a Group II metal.</u>
43. The method according to claim 42, wherein prior to the dehydrating, the calcium-promoted		15. A process for the synthesis of bio-1,2-alkanediols, comprising:

catalyst has been calcined at a temperature of about 440 °C to about 460 °C.		providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms, wherein the bio-alkene results from a process wherein a bio-1-alcohol is dehydrated by heating the bio-1-alcohol in a reactor with a catalyst, <u>wherein the γ-alumina catalyst is treated with a calcium promoter to provide a modified γ-alumina catalyst.</u>
44. The method according to claim 43, wherein the reactor is heated at a temperature of 315 °C to 350 °C.		16. The process according to claim 15, <u>wherein the modified γ-alumina catalyst is calcined to provide a calcined γ-alumina catalyst.</u>
		17. The process according to claim 16, <u>wherein the calcium promoter is used in an amount of about 0.01 weight percent to about 4 weight</u>

		<u>percent based on the weight of CaO determined after calcination.</u>
		18. The process according to claim 17, <u>wherein the calcium promoter is used in an amount of about 1 weight percent to about 2 weight percent based on the weight of CaO determined after calcination.</u>
		19. The process according to claim 15 <u>wherein a temperature during calcination is about 400° C. to about 500° C.</u>
		20. The process according to claim 19, <u>wherein the temperature during calcination is about 420° C to about 480° C.</u>
		21. The process according to claim 20, <u>wherein the temperature during calcination is about 440° C. to about 460° C.</u>
		22. The process according to claim 15, wherein calcination is carried out in an oven.

		23. The process according to claim 15, <u>wherein the calcination is carried out in an atmosphere of air or inert gas.</u>
	24. The process according to claim 6, wherein the bio-alkene undergoes a distillation step to refine the bio-alkene prior to converting the bio-alkene to the bio-1,2-alkanediol.	
	25. The process according to claim 6, wherein the bio-1,2-alkanediol formed from the bio-alkene undergoes a final distillation step to refine the bio-1,2-alkanediol.	
	26. The process according to claim 1, wherein the bio-alkene results from a process wherein the bio-1-alcohol in water is dehydrated by heating the bio-1-alcohol with a catalyst under a purge gas.	
		27. A process for the synthesis of bio-1,2-alkanediols, comprising: providing a bio-alkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene

		regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms, wherein the bio-alkene is converted to the bio-1,2-alkanediol by reacting the bio-alkene in the presence of at least one of formic acid or acetic acid and a peroxide to form a bio-1,2-epoxyalkane having an epoxy ring, and contacting the 1,2-epoxyalkane with water and sodium hydroxide to form the bio-1,2-alkanediol.
	28. The process according to claim 1, wherein the process yields at least about 60% to about 99% of the bio-1,2-alkanediol.	
	29. The process according to claim 28, wherein the process yields at least about 72% to about 99% of the bio-1,2-alkanediol.	
		30. A process for making bio-1,2-alkanediols, comprising:

		providing a bio-1-alcohol and a catalyst treated with a base; dehydrating the bio-1-alcohol in the presence of the catalyst to form a bioalkene having a carbon chain of about 5 to about 20 carbon atoms and a bio-1-alkene regioselectivity of at least about 80%; and converting the bio-alkene to a bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms.
		31. The process according to claim 30, <u>wherein the catalyst is a γ-alumina catalyst and the base comprises calcium.</u>
		32. The process according to claim 31, <u>wherein the γ-alumina catalyst is treated with a calcium promotor and after treatment is calcined at a temperature of about 400° C. to about 500° C.</u>
		33. The process according to claim 30, wherein the process yields about

		72% to about 99% of the bio-1,2-alkanediol.
		34. The process according to claim 30, wherein the bio-1-alkene regioselectivity is about 95% to about 99%.
	35. The process of claim 1, wherein the bio-alkene is converted to the bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms by reacting the bio-alkene in the presence of at least one of a peracid and a hydroxide to form a reaction product, and contacting the reaction product with water and a base to form the bio-1,2-alkanediol.	
	36. The process according to claim 35, wherein the bio-alkene is converted to the bio-1,2-alkanediol by reacting the bio-alkene in the presence of at least one of formic acid or acetic acid and a peroxide to form a bio-1,2-epoxyalkane having an epoxy ring, and contacting the 1,2-epoxyalkane with water and	

	sodium hydroxide to form the bio-1,2-alkanediol.	
		37. The process according to claim 30, wherein the bio-alkene is converted to the bio-1,2-alkanediol having a carbon chain length of about 5 to about 20 carbon atoms by reacting the bio-alkene in the presence of at least one of a peracid and a hydroxide to form a reaction product, and contacting the reaction product with water and a base to form the bio-1,2-alkanediol.
		38. The process according to claim 37, wherein the bio-alkene is converted to the bio-1,2-alkanediol by reacting the bio-alkene in the presence of at least one of formic acid or acetic acid and a peroxide to form a bio-1,2-epoxyalkane having an epoxy ring, and contacting the 1,2-epoxyalkane with water and sodium hydroxide to form the bio-1,2-alkanediol.