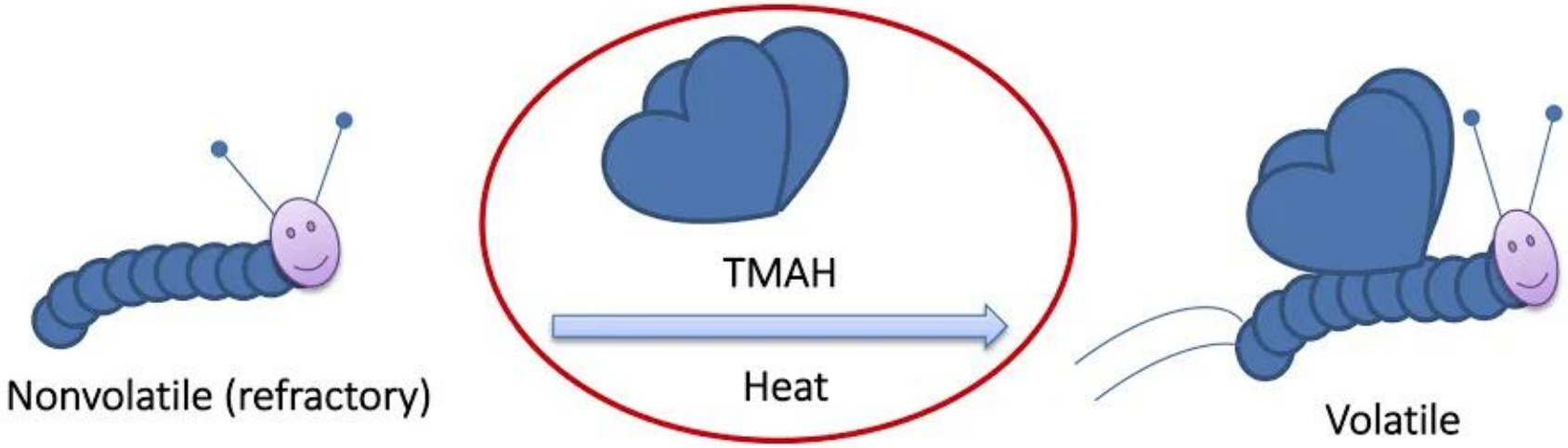
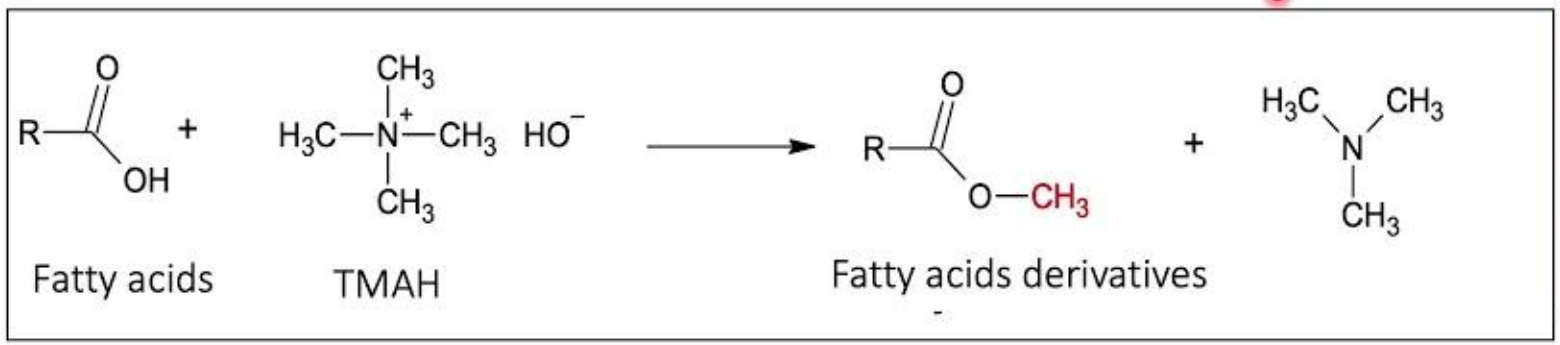
Background

What is TMAH thermochemolysis?





Volatility ↑

Polarity ↓

1
00:00:08,070 --> 00:00:04,550
hello everyone i'm

2
00:00:11,830 --> 00:00:08,080
from central superlike and

3
00:00:14,549 --> 00:00:11,840
i did my ph.d and soundtalk super like

4
00:00:15,589 --> 00:00:14,559
but now i'm a postdoc from i am a pm

5
00:00:18,950 --> 00:00:15,599
essay

6
00:00:22,390 --> 00:00:18,960
today i mainly talk about my work

7
00:00:24,870 --> 00:00:22,400
from my phd study the search for

8
00:00:26,550 --> 00:00:24,880
life biosecond nutritional mars the

9
00:00:30,870 --> 00:00:26,560
detection of dna with

10
00:00:34,630 --> 00:00:30,880
ti major thermal chemists on sam

11
00:00:35,430 --> 00:00:34,640
and they know mars has been very popular

12
00:00:38,470 --> 00:00:35,440
these days

13
00:00:41,430 --> 00:00:38,480

and we are trying to search for

14
00:00:41,750 --> 00:00:41,440
live bios like neutrals on mars and this

15
00:00:43,990 --> 00:00:41,760
is

16
00:00:44,950 --> 00:00:44,000
because the past environmental

17
00:00:48,549 --> 00:00:44,960
conditions

18
00:00:51,670 --> 00:00:48,559
on mars are like the earth today

19
00:00:54,630 --> 00:00:51,680
and this means

20
00:00:55,750 --> 00:00:54,640
the mars could be conducive to the

21
00:00:58,950 --> 00:00:55,760
emergence

22
00:00:59,750 --> 00:00:58,960
of probiotic chemistry or even the

23
00:01:02,869 --> 00:00:59,760
origin of

24
00:01:06,070 --> 00:01:02,879
life until now on mars

25
00:01:07,109 --> 00:01:06,080
they have found the perennial liquid

26
00:01:10,390 --> 00:01:07,119
water

27
00:01:13,590 --> 00:01:10,400
some organic molecules and there are

28
00:01:16,950 --> 00:01:13,600
energy sources so if it's

29
00:01:22,230 --> 00:01:16,960
possible to find some left bell

30
00:01:29,190 --> 00:01:25,749
and to answer these questions they

31
00:01:32,630 --> 00:01:29,200
need to do the insulting analysis

32
00:01:35,990 --> 00:01:32,640
by robbers they hand waking

33
00:01:40,230 --> 00:01:36,000
curiosity perseverance and

34
00:01:44,389 --> 00:01:40,240
extra mars and we also have

35
00:01:47,350 --> 00:01:44,399
the lab simulation experiments

36
00:01:50,789 --> 00:01:47,360
and the lab results will support the

37
00:01:54,630 --> 00:01:50,799
data collected by this rover

38
00:01:59,109 --> 00:01:54,640

and among these rovers they had waking

39
00:02:03,910 --> 00:01:59,119
curiosity rover and extra mars

40
00:02:07,429 --> 00:02:03,920
these three rovers they have their

41
00:02:10,790 --> 00:02:07,439
sample analysis instruments

42
00:02:14,150 --> 00:02:10,800
and by

43
00:02:17,190 --> 00:02:14,160
like sam and the moma and they can

44
00:02:22,070 --> 00:02:17,200
do the insulting analysis

45
00:02:25,030 --> 00:02:22,080
of the martian samples

46
00:02:26,309 --> 00:02:25,040
and during the institute analysis of

47
00:02:32,070 --> 00:02:26,319
martian samples

48
00:02:35,830 --> 00:02:32,080
we will apply the derivation method

49
00:02:39,110 --> 00:02:35,840
here we can say the enzyme we have

50
00:02:41,830 --> 00:02:39,120
different capacitors containing the

51
00:02:42,470 --> 00:02:41,840
relationship engines here the green

52
00:02:47,750 --> 00:02:42,480
colors

53
00:02:50,390 --> 00:02:47,760
the tmih and mtbs tfa and dmif

54
00:02:52,550 --> 00:02:50,400
and they already have done some work

55
00:02:54,390 --> 00:02:52,560
experiments with the generalization

56
00:02:58,229 --> 00:02:54,400
method

57
00:02:58,949 --> 00:02:58,239
for example in last year november we did

58
00:03:02,070 --> 00:02:58,959
the first

59
00:03:04,110 --> 00:03:02,080
tmh experiments on mars and today they

60
00:03:07,110 --> 00:03:04,120
mainly talk about the tmh

61
00:03:10,390 --> 00:03:07,120
thermochamalysis so

62
00:03:10,949 --> 00:03:10,400
what's the tmatriosomal chemolysis it's

63
00:03:14,070 --> 00:03:10,959

like

64
00:03:17,190 --> 00:03:14,080
we have non-volatile compounds

65
00:03:18,390 --> 00:03:17,200
that is this means it's very difficult

66
00:03:21,430 --> 00:03:18,400
to be detected

67
00:03:24,149 --> 00:03:21,440
by our device but if we apply

68
00:03:25,990 --> 00:03:24,159
our tmh thermal camolysis the

69
00:03:29,190 --> 00:03:26,000
non-volatile compounds

70
00:03:32,390 --> 00:03:29,200
will become volatile and

71
00:03:33,270 --> 00:03:32,400
it can be detected by our device here we

72
00:03:37,589 --> 00:03:33,280
give one

73
00:03:41,110 --> 00:03:37,599
example when we apply our tmh

74
00:03:42,229 --> 00:03:41,120
to analyze fatty acids the menstrual

75
00:03:45,190 --> 00:03:42,239
functional group

76
00:03:46,390 --> 00:03:45,200
from tmh will replace the active

77
00:03:50,390 --> 00:03:46,400
hydrogen of

78
00:03:54,789 --> 00:03:50,400
fatty acids so unless they

79
00:03:57,190 --> 00:03:54,799
will have the fatty acids derivatives

80
00:03:58,309 --> 00:03:57,200
so the during the tiamix thermal

81
00:04:02,070 --> 00:03:58,319
chemistry

82
00:04:06,470 --> 00:04:02,080
it will help to increase the mortality

83
00:04:09,670 --> 00:04:06,480
and decrease the polarity of the sample

84
00:04:12,789 --> 00:04:09,680
so we can say in this process the

85
00:04:16,229 --> 00:04:12,799
tmh summer camelisis played a very

86
00:04:20,550 --> 00:04:19,590
and as we mentioned before we are trying

87
00:04:23,909 --> 00:04:20,560
to

88
00:04:27,189 --> 00:04:23,919

search for life signatures on mars

89
00:04:29,430 --> 00:04:27,199
and we know there are so many

90
00:04:31,110 --> 00:04:29,440
important organic compounds they're

91
00:04:34,150 --> 00:04:31,120
important for life

92
00:04:37,590 --> 00:04:34,160
but for dna and on a

93
00:04:37,990 --> 00:04:37,600
they they are they are essential for

94
00:04:39,990 --> 00:04:38,000
life

95
00:04:42,710 --> 00:04:40,000
because they carry the information of

96
00:04:46,230 --> 00:04:42,720
life so they'd like to say

97
00:04:49,350 --> 00:04:46,240
if it's possible to detect the life that

98
00:04:54,469 --> 00:04:49,360
the dna from life cells

99
00:04:58,390 --> 00:04:54,479
these are tr major thermal chemists

100
00:05:01,670 --> 00:04:58,400
that have been applied on sam

101
00:05:03,590 --> 00:05:01,680
so to achieve these goals we started

102
00:05:06,550 --> 00:05:03,600
with a very simple

103
00:05:07,670 --> 00:05:06,560
chemical standards first we apply our

104
00:05:10,790 --> 00:05:07,680
tmh

105
00:05:12,310 --> 00:05:10,800
soma camilysis to analyze the seven

106
00:05:16,150 --> 00:05:12,320
nuclear bases

107
00:05:19,749 --> 00:05:16,160
the nuclear size and the nucleotides

108
00:05:23,430 --> 00:05:19,759
and then they applied a polymers here

109
00:05:26,950 --> 00:05:23,440
it's poly a because this is a tile

110
00:05:29,670 --> 00:05:26,960
way and next we applied

111
00:05:31,590 --> 00:05:29,680
the tia major thermocouples to analyze

112
00:05:34,230 --> 00:05:31,600
the dna fragments

113
00:05:35,110 --> 00:05:34,240

from the life cells here we choose e

114
00:05:42,230 --> 00:05:35,120
coli

115
00:05:44,870 --> 00:05:42,240
and very easier to get it

116
00:05:45,270 --> 00:05:44,880
so all these experiments they have been

117
00:05:48,909 --> 00:05:45,280
done

118
00:05:50,830 --> 00:05:48,919
with the pyrolysis and against

119
00:05:54,550 --> 00:05:50,840
chromatography and the mass

120
00:05:58,629 --> 00:05:54,560
spectrometer this device

121
00:06:01,990 --> 00:05:58,639
has the same mechanism

122
00:06:05,590 --> 00:06:02,000
with some instrument so you can apply

123
00:06:10,469 --> 00:06:05,600
the pyrgcms to analyze

124
00:06:13,909 --> 00:06:10,479
to do the simulation experiments in lab

125
00:06:17,189 --> 00:06:13,919
first like make the the

126
00:06:20,710 --> 00:06:17,199
nuclear bases with tmj summer camalysis

127
00:06:22,230 --> 00:06:20,720
experiments we only take the anthony as

128
00:06:25,270 --> 00:06:22,240
an example

129
00:06:28,550 --> 00:06:25,280
so when we apply tmh to

130
00:06:31,430 --> 00:06:28,560
analyze the nuclear the antonine

131
00:06:32,629 --> 00:06:31,440
we can say the messel functional group

132
00:06:35,909 --> 00:06:32,639
from tmh

133
00:06:37,510 --> 00:06:35,919
will replace the active hydrogen from

134
00:06:41,510 --> 00:06:37,520
adenine

135
00:06:45,590 --> 00:06:41,520
so they have different derivatized

136
00:06:48,309 --> 00:06:45,600
adenine from the result they can say

137
00:06:51,909 --> 00:06:48,319
they have different peaks

138
00:06:55,909 --> 00:06:51,919

of mesolithic anteline this is because

139
00:06:59,670 --> 00:06:55,919
for anthony they have it has isomers

140
00:07:02,629 --> 00:06:59,680
and when we apply tmh to the derivation

141
00:07:04,350 --> 00:07:02,639
we have different cases they have

142
00:07:07,510 --> 00:07:04,360
vitamin cell

143
00:07:10,070 --> 00:07:07,520
replacement and two main cell

144
00:07:12,870 --> 00:07:10,080
products and the three massive

145
00:07:17,110 --> 00:07:12,880
functional groups

146
00:07:19,589 --> 00:07:17,120
replacement so

147
00:07:20,469 --> 00:07:19,599
that's where they have different pics

148
00:07:22,950 --> 00:07:20,479
from

149
00:07:24,629 --> 00:07:22,960
uh tiana makes them a commonalist with

150
00:07:28,230 --> 00:07:24,639
anthony

151
00:07:31,909 --> 00:07:28,240
and they also compare the peak intensity

152
00:07:35,110 --> 00:07:31,919
of anthony at different temperature

153
00:07:38,150 --> 00:07:35,120
we can say with increase of temperature

154
00:07:41,589 --> 00:07:38,160
the intensity of mesolithic adenine is

155
00:07:42,950 --> 00:07:41,599
highest and 600 degrees so we say that

156
00:07:45,990 --> 00:07:42,960
600 degree

157
00:07:49,510 --> 00:07:46,000
is the optimal temperature for the

158
00:07:52,710 --> 00:07:49,520
detection of nuclear bases

159
00:07:56,070 --> 00:07:52,720
and next we analyze

160
00:07:59,189 --> 00:07:56,080
the da da mp and the atp

161
00:08:01,990 --> 00:07:59,199
with tmaj thermal camoulysis

162
00:08:04,309 --> 00:08:02,000
when they we can say from the result

163
00:08:05,830 --> 00:08:04,319

they found their typical structure the

164
00:08:09,430 --> 00:08:05,840
menstrual fulfarial

165
00:08:12,230 --> 00:08:09,440
musculated phosphate and we found the

166
00:08:12,950 --> 00:08:12,240
muscle lady nuclear bases are the main

167
00:08:17,029 --> 00:08:12,960
products

168
00:08:19,589 --> 00:08:17,039
from the these dna fragments

169
00:08:20,309 --> 00:08:19,599
and surprisingly we also found the

170
00:08:23,909 --> 00:08:20,319
message

171
00:08:27,749 --> 00:08:23,919
d a from

172
00:08:30,869 --> 00:08:27,759
d a d a m p and the atp

173
00:08:34,870 --> 00:08:30,879
with tmatr somocamolysis and this

174
00:08:40,790 --> 00:08:34,880
means our tmh can protect

175
00:08:43,430 --> 00:08:40,800
the structure of our dna fragments

176
00:08:44,949 --> 00:08:43,440
and though they analyzed the nuclear

177
00:08:48,230 --> 00:08:44,959
bases they found that

178
00:08:49,910 --> 00:08:48,240
temperature can influence the detection

179
00:08:54,790 --> 00:08:49,920
of dna fragments

180
00:08:56,630 --> 00:08:54,800
so we did we optimize the temperature

181
00:08:59,990 --> 00:08:56,640
for the detection of da

182
00:09:03,910 --> 00:09:00,000
da mp and d80p they found

183
00:09:09,509 --> 00:09:03,920
200 degrees in the optimal temperature

184
00:09:13,030 --> 00:09:09,519
for the detection of these dna fragments

185
00:09:15,670 --> 00:09:13,040
and we found that if you'd like to

186
00:09:16,310 --> 00:09:15,680
detect the phosphate the hepato should

187
00:09:20,430 --> 00:09:16,320
it be

188
00:09:21,590 --> 00:09:20,440

and 300 degrees and to detect the

189
00:09:24,710 --> 00:09:21,600
deoxyribose

190
00:09:27,190 --> 00:09:24,720
temperature should be at 600 degrees

191
00:09:28,150 --> 00:09:27,200
and for the detection of nuclear bases

192
00:09:37,910 --> 00:09:28,160
here

193
00:09:41,030 --> 00:09:37,920
we can imagine

194
00:09:41,910 --> 00:09:41,040
if we analyze the poly a at very high

195
00:09:44,470 --> 00:09:41,920
temperature

196
00:09:46,790 --> 00:09:44,480
this poly a could be decomposed to

197
00:09:50,150 --> 00:09:46,800
several parts

198
00:09:53,509 --> 00:09:50,160
but when they apply rtmh

199
00:09:56,790 --> 00:09:53,519
to analyze the poly a we found their

200
00:10:00,230 --> 00:09:56,800
typical structure of dna fragments

201
00:10:03,509 --> 00:10:00,240
and we also found the

202
00:10:06,790 --> 00:10:03,519
mesolated dna from

203
00:10:10,949 --> 00:10:06,800
poly a with tmatr summer camolysis

204
00:10:14,710 --> 00:10:10,959
so again this proved that tmh

205
00:10:17,990 --> 00:10:14,720
can protect all poly a from

206
00:10:21,030 --> 00:10:18,000
degrading and lastly

207
00:10:22,389 --> 00:10:21,040
analyze the dna fragments from the e

208
00:10:25,030 --> 00:10:22,399
coli cells

209
00:10:25,750 --> 00:10:25,040
and we can say from the result we found

210
00:10:29,030 --> 00:10:25,760
almost

211
00:10:31,750 --> 00:10:29,040
all of the nuclear bases with rtmh

212
00:10:33,350 --> 00:10:31,760
from our e-coli cells and also they

213
00:10:36,870 --> 00:10:33,360

found the

214
00:10:39,190 --> 00:10:36,880
met the typical structure of like

215
00:10:40,150 --> 00:10:39,200
the messenger phosphate medicine of a

216
00:10:42,949 --> 00:10:40,160
ferrio

217
00:10:45,190 --> 00:10:42,959
and this means or tm matrix thermal

218
00:10:48,310 --> 00:10:45,200
carbolysis can be applied to

219
00:10:53,030 --> 00:10:48,320
analyze the dna fragments from

220
00:10:56,310 --> 00:10:53,040
cells so unless we conclude that

221
00:10:57,670 --> 00:10:56,320
our ti matri semicondolysis can be used

222
00:11:00,790 --> 00:10:57,680
to

223
00:11:01,350 --> 00:11:00,800
search for life second signatures such

224
00:11:05,269 --> 00:11:01,360
as

225
00:11:09,829 --> 00:11:05,279
dna or a fragments from life cells

226
00:11:12,550 --> 00:11:09,839
but this is only the first step for the

227
00:11:13,509 --> 00:11:12,560
detection of lifestyle markers from

228
00:11:17,190 --> 00:11:13,519
sales

229
00:11:19,350 --> 00:11:17,200
and next we can analyze the bacteria

230
00:11:22,470 --> 00:11:19,360
that have been detected in emerging

231
00:11:25,350 --> 00:11:22,480
analogues that will be more interesting

232
00:11:26,550 --> 00:11:25,360
and all results will provide important

233
00:11:29,190 --> 00:11:26,560
reference data

234
00:11:31,910 --> 00:11:29,200
for the interpretation of data collected

235
00:11:34,150 --> 00:11:31,920
by the rovers

236
00:11:37,030 --> 00:11:34,160
and last i'd like to thank you for the

237
00:11:38,230 --> 00:11:37,040
support of french space agency and sam

238
00:11:41,509 --> 00:11:38,240

muma founding

239
00:11:43,190 --> 00:11:41,519
and also thanks for the support of cesar

240
00:11:46,389 --> 00:11:43,200
scholarship