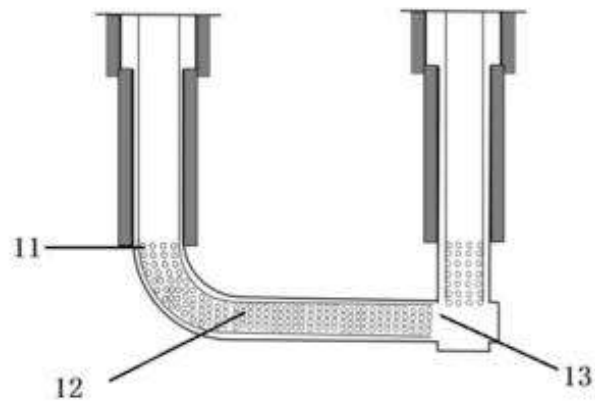


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PN - [CN114016991](#) A 20220208
PNFP - CN114016991B B 20221021
PR - CN20211188058 20210916
AP - CN20211188058 20210916
DT - I
CT - || STSE (A)
[CN101629485](#) A 20100120
[A] (INST OF EXPLORATION
TECH CHINE)
[A] 1-5
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[CN103090571](#) A 20130508
[A] (YAO YAMING)
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[CN104654641](#) A 20150527
[A] (UNIV NORTH CHINA
WATER & RESOU)
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[CN105652342](#) A 20160608
[A] (CHINA PETROLEUM &
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[CN107388611](#) A 20171124
[A] (CHINA SALT PROSPECTING
DESIGN INST CO LTD)
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[CN107476797](#) A 20171215
[A] (SHAANXI COALFIELD
GEOLOGY GROUP CO LTD)
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[CN107605455](#) A 20180119
[A] (SHAANXI COAL GEOLOGY
GROUP CO LTD)
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[CN109751044](#) A 20190514
[A] (UNIV HENAN
POLYTECHNIC)
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[US2020049380](#) A1 20200213
[A] (CAIRNS PAUL [CA], et al)
[A] 1-5
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[CN113294137](#) A 20210824
[A] (UNIV XI AN JIAOTONG, et



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	[A] 1-5* 全文 *
CTNP	- STSE (A)
	[A] - 樊传忠, "采卤深井预防结晶堵塞的措施", 《中国井矿盐》
	[A] 1-5
	* 全文 *
	[A] - 李子丰等, "对接水平井及其井间导航轨道控制技术", 《天然气工业》
	[A] 1-5
	* 全文 *
	[A] - 彭涛等, "淮南朱集井田现今地温场特征及其影响因素分析", 《西安科技大学学报》
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CI	- E21B7/04 (CN)
	- E21B7/06 (CN)
	- E21B43/086 (CN)
	- E21B43/103 (CN)
	- E21B43/305 (CN)
	- E21B47/07 (CN)
	- G06F30/20 (CN)
CA	- Y02E10/10 (EP)
PA	- (A)
	UNIV XI AN JIAOTONG; SINOPEC GREEN ENERGY GEOTHERMAL SHAANXI DEV CO LTD
TI	- (A)
	Method for determining well bore structure of butt joint well based on ground temperature field distribution characteristics
AB	- (A)
	The invention belongs to the technical field of geothermal wells and particularly discloses a method for determining a well bore structure of a butt joint well based on ground temperature field distribution characteristics. The method comprises the following steps that a distance between a

horizontal **well** and a vertical **well** is determined, the horizontal **well** and the vertical **well** are respectively formed till secondary drilling is finished, and temperature acquisition probes are respectively put along the horizontal **well** and the vertical **well**; a plurality of first logging temperatures of the horizontal **well** and a plurality of second logging temperatures of the vertical **well** are respectively collected in a plurality of same construction units in the horizontal **well** and the vertical **well**, and a horizontal **well** ground temperature **gradient** simulation curve and a vertical **well** ground temperature **gradient** simulation curve are respectively determined according to a plurality of first logging temperatures and a plurality of second logging temperatures; according to the temperature increasing rate of the horizontal **well** ground temperature **gradient** simulation curve, the butt joint **well** deflecting point range is determined, and when the horizontal **well** ground temperature **gradient** simulation curve and the vertical **well** ground temperature **gradient** simulation curve have a plurality of intersection points and the change trend is stable, the horizontal **well** target point vertical depth and the vertical **well** vertical depth are determined; and according to the position range of the deflecting point, the vertical depth of the target point of the horizontal **well**

and the vertical depth of the vertical **well**, the butt-joint **well** bore structure is determined.

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- PN - [CN210685972U](#) U 20200605
- PR - CN201921357420U 20190821
- AP - CN201921357420U 20190821
- DT - I
- PA - CHINA COALFIELD HUASHENG HYDROGEOLOGICAL INVESTIG CO LTD
- TI - Temperature measuring device for L-shaped **geothermal well**
- AB - The utility model discloses a temperature measuring device for an L-shaped **geothermal well**. The temperature measuring device comprises a control part, a temperature measuring optical fiber, a traction frame and a spherical balance weight, one end of the temperature measuring optical fiber is connected with the control part, and the other end of the temperature measuring optical fiber is connected with the traction frame; the spherical balance weight is installed on the traction frame and can rotate on the traction frame. The balance weight is designed to be spherical and installed on the traction frame, so that the spherical balance weight can rotate on the traction frame, the interior of the spherical balance weight sleeve moves forwards in a rolling mode along the **gradient** of the **well** wall under the action of gravity, the tail of the spherical balance weight sleeve carries the distributed temperature measuring optical fibers to enter a **well**, and the problem that the temperature measuring optical fibers enter an inclined **well** or a near-horizontal **well** to be blocked is solved. The method is suitable for being used in the horizontal **geothermal well** with the **well** deviation ranging from 0 degree to 88 degrees. Meanwhile, the safety coefficient in the **well** is increased, and the device has the advantages of simple structure, low manufacturing cost, convenience in installation and the like.

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- PN - [CN110685679](#) A 20200114
- PR - CN20191178905 20191107
- AP - CN20191178905 20191107
- DT - I
- CI - E21B49/00 (CN)
- PA - SHANXI INST OF ENERGY
- TI - Method for calculating wellhead temperature of **geothermal well**
- AB - The invention discloses a method for calculating the wellhead temperature of a **geothermal well**. The method comprises the steps that 1, the **geothermal gradient** is calculated according to the known formation temperature; 2, the total heat transfer coefficient values U and A are calculated; 3, due to the fact the specific heat of water changes along with depth, gradual iterative computation is carried out from shallow to deep to the fluid temperature of the target depth; and 4, for single production layers, iterative computation can be directly carried out to a wellhead, and for a multi-production layer, the water amount of all the single production layers are firstly added to obtain the new total water yield, and then the wellhead temperature is calculated according to the specific heat, temperature and yield parameter values of the water. According to the method, it is considered

that **geothermal** resources in multi-layer **geothermal** reservoirs need to be mix-produced, the wellhead temperature is calculated through a model, and the change process of the instantaneous temperature field around a shaft and the wellhead temperature along with time can be obviously reflected.

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PN - [RU2016108175](#) A 20170914

PNFP - RU2632800 C2 20171009

PR - RU20160108175 20160309

AP - RU20160108175 20160309

DT - I

CT - || STSE (C2)
[SU1375806](#) A1 19880223 [] (GNI PI NEFTYANOJ PROMY [SU]);
[RU2061220](#) C1 19960527 [] (VNEDRENCHESKIY NI INZH TS NEFT [RU]);
[RU2186211](#) C1 20020727 [] (OGICHESKAJA KOMPANIJA ROSSIJSK, et al);
[WO2013151455](#) A1 20131010 [] (OBSHCHESTVO S OGRANICHENNOY OTVETSTVENNOSTYU SPLIT [RU], et al)

CTNP - || STSE (C2)
 [] - КОНОПЛЕВ Ю.В. и др., Геофизические методы контроля разработки нефтяных месторождений, Москва, Недра 1986. стр. 51,52, 130-143.

CI - E21B47/07 (RU)

- G01N15/08 (RU)

PA - (C2)

GOSUDARSTVENNOBYUDZHETNOEOBRAZOVATELNOEUCHREZHDENIEVYSSHEGO OBRAZOVANIYAALMETEVSKIYGOSUDARSTV [RU]

TI - (C2)

METHOD FOR DETERMINING ACTUAL OIL SATURATION FACTOR IN **WELL** WHEN DEVELOPING OIL-BEARING FORMATION

AB - (C2)

FIELD: oil and gas industry.SUBSTANCE: invention can be used directly for high-precision determination of oil saturation factor for actual oil-saturation of production formations with high resolution of formation thickness in both cased and uncased wells filled with liquid and can be used to solve a wide range of problems associated with the development, exploration and production of minerals. The method includes using thermometric data in stationary **well** to determine actual oil saturation factor in the formation, the results of which are used to determine **geothermal gradient** in the formation, the actual thermal conductivity of the formation is calculated from the obtained data of underlaying heat flow and the **geothermal gradient**. Then, according to the conducted research and statistical studies of the correlation dependence between thermal conductivity and oil saturation, the actual oil saturation factor (K) by the formulas $G=(T-T)/H-H=\Delta T/\Delta H$, (5), where H-formation cap depth; H- formation bottom depth; T- temperature on formation cap at depth H; T- temperature on formation bottom at depth H; ΔT - temperature difference measurement points, i.e. between formation cap and bottom; ΔH - distance between measurement points. $\lambda=Q/G$, (4), where Q is underlaying heat flow, W/m; G is **geothermal gradient** in formation, °C/m. $K=-31,503 \cdot \lambda + 100.22$ (3), where λ - is thermal conductivity of rock, W/m·K.EFFECT: based on this information, development department and process department have an opportunity to simulate the dynamic of hydrocarbon reserves development, monitor and forecast geological and technical measures to increase oil production, calculate various options for

development of production formations, and choose the most effective ones, which will increase profitability of oil production and increase oil recovery from formations.2 tbl, 6 dwg

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PN - [CN102536211](#) A 20120704

PR - CN201110341179 20111102

AP - CN201110341179 20111102

DT - I

CT - || STSE (A)
[CN2639512Y](#) Y 00000000 [A]

[A] 1-2

* 全文 *;

[CN1245243](#) A 00000000 [A]

[A] 1-2

* 全文 *;

[CN102168551](#) A 00000000 [A]

[A] 1-2

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[CN1970991](#) A 00000000 [A]

[A] 1-2

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CTNP - || STSE (A)
[X] - 郑海金等, "能耗最低机采系统设计方法的研究及应用", 《石油学报》, (20070331), vol. 28, no. 2, pages 129 - 132
[X] 1-2
* 论文“1.2 各种功率的定义及影响因素”部分 *

PA - CHINA PETROLEUM & CHEMICAL; CHINA PETROCHEMICAL CORP JIANGSU OILFIELD BRANCH; YANGZHOU JIANGSU OILFIELD RUIDA PETROLEUM ENGINEERING TECHNOLOGY DEV CO LTD

TI - Method for measuring and calculating liquid outlet temperature of **well** mouth of pumping unit **well**

AB - The invention relates to the technical field of petroleum exploitation, in particular to a method for measuring and calculating the liquid outlet temperature of a **well** mouth of a pumping unit **well**, which aims to solve the problem of incapability of accurately calculating the liquid outlet temperature of the **well** mouth of the pumping unit **well** by the conventional measurement and calculation method. In order to solve the problem, the method for measuring and calculating the liquid outlet temperature of the **well** mouth of the pumping unit **well** is provided. The method comprises the following steps of: acquiring the liquid yield of an oil **well**; acquiring the moisture content of the oil **well**; measuring the depth of a working fluid level; acquiring a **geothermal gradient**; measuring the depth of an oil layer; calculating expansion power of solution gas; and calculating the liquid outlet temperature of the **well** mouth of the pumping unit **well** according to the parameters. By the method, influences on specific factors/variables of the liquid outlet temperature of the **well** mouth are reflected accurately, so that the liquid outlet temperature of the **well** mouth of the pumping unit **well** can be calculated accurately; and therefore, a good foundation is laid on operation processes of grasping temperature variation and viscosity variation in a **well** bore of the oil **well**, acquiring wax elimination and prevention rules of the oil **well**, determining collection and transportation modes and the like.

PN - [RU2125149](#) C1 19990120

PR - RU19980111213 19980611

AP - RU19980111213 19980611

DT - I

PA - VJAKHIREV REM IVANOVICH; REMIZOV VALERIY VLADIMIROVICH; ERMILOV OLEG MIKHAILOVICH; DEGTJAREV BORIS VASILEVICH; CHUGUNOV LEONID SEMENOVICH; KONONOV VIKTOR IVANOVICH; KONTOROVICH ALEKSEJ EHMIL EVIC; DOBRETISOV NIKOLAJ LEONT EVICH; BASNIEV KAPLAN SAFERBIEVICH; PODOLJAKO MIKHAIL IVANOVICH

TI - METHOD FOR DETERMINING LOWER BOUNDARY OF OCCURRENCE OF PERMAFROST GROUND

AB - FIELD: oil and gas production industry. SUBSTANCE: this can be used in operation of producing wells in areas of permafrost ground so as to preserve ground around mouth zone of **well** in frozen condition during entire service period of **well**. According to method, undertaken are geophysical investigations which consist in carrying out logging operations in drilled wells. **Geothermal gradient** is measured at 25-50 m intervals when performing logging operations. Obtained data are plotted in diagram, and straight lines are drawn through them which correspond to **geothermal** gradients in frozen and non-frozen zones. Conclusions are made according to crossing points of these straight lines about depth of lower boundary of occurrence of permafrost ground. Application of aforesaid method improves accuracy in finding required data. EFFECT: higher efficiency. 2 cl, 1 dwg